C144-E072-01EN

ETERNUS LT160 Tape Library

User's Guide

FUJITSU

FOR SAFE OPERATION

This manual contains important information regarding the use and handling of this product. Read this manual thoroughly. Pay special attention to the section "FOR SAFE OPERATION" Use the product according to the instructions and information available in this manual. Keep this manual handy for further reference.

Fujitsu makes every effort to prevent users and bystanders from being injured or damage to their property. Use the product according to this manual.

ABOUT THIS PRODUCT

This product is designed and manufactured for use in standard applications such as office work, personal devices and household appliances. This product is not intended for special uses (atomic controls, aeronautic or space systems, mass transport controls, medical devices for life support, or weapons firing controls) where particularly high reliability requirements exist, where the pertinent levels of safety are not guaranteed, or where a failure or operational error could threaten a life or cause a physical injury (hereafter referred to as "mission-critical" use). Customers considering the use of these products for mission-critical applications must have safety-assurance measures in place beforehand. Moreover, they are requested to consult our sales representative before embarking on such specialized use.

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RADIO FREQUENCY INTERFERENCE STATEMENT

The following notice is for EU users only.

WARNING: This is a product which meets Class A of EN55022. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

The following notice is for USA users only.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Laser Standard

The Fibre Channel printed circuit board contains a laser system (GBIC or GLM module). Laser systems are classified as Class I Laser Equipment by the radiation standards of the Department of Health and Human Services (DHHS) in accordance with Radiation Control for Health and Safety Act of 1968 and also based on the safety requirements for laser products in EN60825-1 (+A11). The certificate of conformance is affixed to the module.

RELATED STANDARDS

The product specifications and functions listed in this manual conform to the following standards:

Standard (document) code	Name	Established by:
ANSI X3.131-1986	American National Standard for Information Systeme-Small Computer System Interface (SCSI)	American National Standards Institute (ANSI)
ANSI X3.131-1994	American National Standard for Information Systeme-Small Computer System Interface-2 (SCSI)	American National Standards Institute (ANSI)
ISO/IEC 10090	90mm Optical Disk Cartridges, rewritable and read only, for data interchange.	ISO/IEC (*1)
ISO/IEC 13963	Data Interchange on 90mm Optical Disk Cartridges Capacity:230 megabytes per cartridge.	ISO/IEC (*1)
ISO/IEC 15041	Data Interchange on 90mm Optical Disk Cartridges Capacity:640 megabytes per cartridge.	ISO/IEC JTC1 (*1)
Cherry Book	GIGAMO 1.3GB 90mm Magneto-Optical Disk System.	FUJITSU LIMITED SONY CORPORATION

*1 ISO = International Organization for Standardization
IEC = International Electrical for Commission
JTC1 = Joint Technical Committee 1

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Revision History

(1/1)

Edition	Date	Revised location (type) (*1)	Revision
01	October 15, 2002	-	-

*1 Items in the "Revised location" column refer to the latest edition unless the item is marked with an asterisk. An asterisk indicates an item in an older edition.

Preface

This manual describes the LT160 magnetic tape library.

This manual first provides an overview of the tape library and then detailed information about the tape library. The detailed information includes specifications, installation requirements and procedures for incorporating the tape library into a system, and information about how to clean the tape library.

The manual is intended for users who have a basic knowledge of magnetic tape libraries and how they are used in computer systems.

The organization of manuals related to the LT160 tape library and the scope of this manual are indicated in the Manual Set section later. Refer to related manuals as necessary.

The organization and contents of this manual are explained below. This information is followed by important information related to handling of the LT160.

Organization of this manual

This manual has seven chapters, appendixes, a glossary, and a list of acronyms and abbreviations.

Chapter 1 Overview

This chapter explains the components and functions of the library.

Chapter 2 Introducing and Preparing the Library

This chapter explains how to install, connect, and set up the library, install the host, turn power on and off, and insert and eject cartridges.

Chapter 3 Library Operation

This chapter explains how to insert or eject a cartridge and how to clean a drive.

Chapter 4 Operator Panel Operation

This chapter explains the screen configuration of the operator panel, the menu hierarchy, referencing of library/drive information, setup of library/drive information, and library procedures, such as opening of the magazine door.

Chapter 5 Remote Panel Operation

This chapter explains the remote panel login method, menu hierarchy, referencing of the library/drive information, and setup of library/drive information.

Chapter 6 Troubleshooting

This chapter provides an overview of maintenance work, explains types of errors and their solutions, and provides troubleshooting information for ordinary problems.

Chapter 7 Cartridge Media and Bar Code Label Specifications

This chapter provides information on Ultrium cartridges and cleaning cartridges, handling of cartridges, bar code label specifications, and maintenance and the service life of cartridges.

Appendix A Model Configurations

This appendix provides a the diagram of the configuration of each library.

Appendix B Technical Specifications

This appendix provides ambient environment, library, physical, and Fibre Channel cable specifications.

Conventions

In this manual, a button or menu that is referred to is indicated as, for example, [OK].

Conventions for Alert Messages

This manual uses the following conventions to show the alert messages. An alert message consists of an alert signal and alert statements. The alert signal consists of an alert symbol and a signal word or just a signal word.

The following are the alert signals and their meanings:

⚠ **CAUTION**	This indicates a hazardous situation *could* result in *minor* or *moderate personal injury* if the user does not perform the procedure correctly. This alert signal also indicates that damages to the product or other property *may* occur if the user does not perform the procedure correctly.
IMPORTANT	This indicates information that could help the user use the product more efficiently.

In the text, the alert signal is centered, followed below by the indented message.

A wider line space precedes and follows the alert message to show where the alert message begins and ends. The following is an example:

(Example)

⚠ CAUTION

Injury: Never move your hands away from the drive module until it is placed in a safe place. Otherwise, the drive module may drop, causing injury if you move your hands away from it after pulling it out beyond this stopper.

The main alert messages in the text are also listed in the "Important Alert Items."

Notice

- If any information in this manual is unclear or incorrect, please complete the comment form at the back of this manual and give it to a Fujitsu systems engineer or salesperson.
- The contents of this manual may be revised without prior notice.

Important Alert Items

Important Alert Messages

The important alert messages in this manual are as follows:

⚠ CAUTION

A hazardous situation *could* result in *minor or moderate personal injury* if the user does not perform the procedure correctly. Also, damages to the product or other property, *may* occur if the user does not perform the procedure correctly.

Task	Alert message	Page
Removing a drive module	**Injury:** Never move your hands away from the drive module until it is placed in a safe place. Otherwise, the drive module may drop, causing injury if you move your hands away from it after pulling it out beyond this stopper.	1-20
	Data loss: Do not perform this operation when the host accesses the drive normally. Otherwise, an error may occur in the drive path.	1-34
Opening and closing a door	**Damage on the library and electrical shock:** Be sure to open and close the front door and internal door after making sure that the device is turned off.	1-21
Inserting a cartridge	**Damage to the library:** If work is done while the front door is open, be careful not to touch the robot, cables, and printed circuits.	3-2
	Damage to the library: Do not insert a cartridge into the following cells: - Cleaning cell (A cleaning cartridge can be inserted.) - Replacement cell - Reserve cell - Diagnostic cell	3-3
	Damage to the library: Never insert a cartridge with the cartridge having the wrong orientation and never insert an out-of-spec cartridge. Otherwise, the robot may be damaged. The robot may not operate normally if a cartridge is inserted into any cell other than the specified one. The insertion location of cartridges differs by model. Refer to Appendix A, "Model Configuration" before inserting a cartridge into the specified cell.	3-4

Task	Alert message	Page
Normal operation	**Data loss:** If a drive is used for the load/unload operation, the drive cannot be used from backup software. Be sure to stop the operation of backup software before performing the load/unload operation.	4-40
Cleaning	**Data loss:** If a drive is used for the load/unload operation, the drive cannot be used from backup software. Be sure to stop the operation of backup software before performing the load/unload operation.	4-41
Restarting the library	**Data loss:** Before turning off and then turning on the power again, consult with the system administrator. Do not turn off and then turn on the power when the interface is active. Otherwise, data loss or a hang-up of the host system may occur.	6-10
Troubleshooting	**Damage to the library:** During troubleshooting, do not insert a defective tape into another drive. The defective tape may damage the drive.	6-11

Important Information on Handling

Maintenance

⚠ WARNING

Users must not attempt to repair the LT160 by themselves. Ask Fujitsu to dispatch one of its engineers or an engineer authorized by Fujitsu for maintenance work.

Disposal of the LT160 and Packing Materials

If you need to dispose of the LT160, follow the instructions provided by maintenance personnel.

Expendable Supplies

Use Fujitsu-designated expendable supplies for the LT160. Using other materials may result in injury to users and bystanders or damage to their property.

Modification or Reconditioning of the LT160

Do not modify the LT160 or overhaul a used product. Doing so may result in injury to users and bystanders or damage to their property.

Operating Environment

This product is designed for use in Japan and cannot be used outside Japan. Fujitsu assumes no responsibility for any consequences resulting from use of the LT160 outside Japan.

Collecting and recycling products used in offices

The LT160 tape library, which is the property of a corporation, must be handled as industrial waste when it disposed of after use. A manifest form (waste management form) must be issued when it is to be disposed of. If you request that Fujitsu dispose of the tape library, Fujitsu's affiliate logistics company (company permitted to collect and transport industrial waste) will pick the tape library up.

Address any inquiries or applications to Fujitsu Recycle System or to the Eco Center of Fujitsu Logistics.

- Fujitsu Recycle System

  (http:/eco.fujitsu.com/info/eco19990827.html)

- Eco Center of Fujitsu Logistics

  (Telephone: 045-470-5305)

Fujitsu Recycle System, which has constructed Fujitsu's recycling system, disassembles used products at its recycle center and segregates components for reuse or recycles them as materials.

Disposal of magnetic tape

Handle magnetic tape that is disposed of as described in "Request for collecting and recycling products used in offices".

LCD unit (operator panel)

The LCD unit (operator panel) in the LT160 contains mercury. To ensure safety, observe the precautions:

- Do not swallow mercury. Mercury is toxic to the body if swallowed.
- Do not handle the LCD unit in such a way that it becomes gaseous, a powder, or a liquid. Inhaling or swallowing mercury that has been burned, crushed, or liquefied with chemical treatment is hazardous.
- Dispose of the LCD unit in accordance with Japanese laws and the waste disposal regulations of your company.
- Dispose of the LCD unit by segregating it from municipal waste or domestic waste.

Bar code reader light source

Do not directly stare at the light source of the bar code reader installed in the LT160. Looking directly at the laser or flash emitted from the light source can cause eye damage.

Manual Organization

Magnetic Tape Library User's Guide (C144-E072) (This Manual)	1 Overview 2 Introducing and Preparing the Library 3 Library Operation 4 Operator Panel Operation 5 Remote Panel Operation 6 Troubleshooting 7 Cartridge Media and Bar Code Label Specifications
Magnetic Tape Library Setup Guide (C144-E073)	1. Overview 2. Setting Up the Tape Library 3. Setting the Fibre Channel Interface 4. Setting the Operating System 5. Setting Backup Software 6. Tuning Backup Performance 7. Troubleshooting

Contents

Preface i

Important Alert Items v

Important Information on Handling vii

Manual Organization ix

Contents xi

Chapter 1 Overview 1-1

1.1 Device Configuration 1-1
1.1.1 Device outline 1-1
1.1.2 Robot 1-4
1.1.3 Each component of the library 1-7
1.1.3.1 Configuration of the basic model components 1-7
1.1.3.2 Special cells 1-8
1.1.3.3 Configuration and upgrade pattern for each model 1-9
1.1.4 Cartridge Access Station (CAS) 1-10
1.1.4.1 Inserting a magazine from CAS 1-11
1.1.4.2 Ejecting a magazine from CAS 1-15
1.1.5 Magazine 1-16
1.1.5.1 Inserting cartridges into the magazine 1-17
1.1.5.2 Ejecting cartridges from the magazine 1-18
1.1.6 Drive module 1-19
1.1.7 Opening/Closing the door 1-21
1.1.7.1 Opening and closing the front door 1-21
1.1.7.2 Opening and closing the internal door 1-23
1.1.7.3 Opening and closing the rear door 1-25
1.1.8 Hardware module (interface card, power supply, and BCR) 1-27
1.2 Functional Overview 1-29
1.2.1 FC control function 1-29
1.2.2 Fast load function 1-29
1.2.3 Inventory function 1-30
1.2.4 Manual load function 1-31
1.2.5 Cleaning function 1-31
1.2.5.1 Auto-cleaning function 1-31
1.2.5.2 Manual cleaning function 1-32
1.2.6 Functions for recovery 1-33
1.2.6.1 Recovery method when a drive error occurs 1-33
1.2.6.2 Recovery method when a library error occurs 1-33
1.2.6.3 Operation to be performed when the host goes down and a cartridge remaining in the drive should be unloaded 1-33
1.2.6.4 Auto-eject function 1-34
1.2.7 Remote panel function 1-34

1.2.8 E-mail function 1-35
1.2.9 SNMP function 1-36

Chapter 2 Introducing and Preparing the Library 2-1

2.1 Installing the Library 2-1
2.1.1 Conditions for library installation 2-1
2.2 Preparing the Host Installation 2-4
2.3 Connecting the Library 2-5
2.4 Power-on and Power-off 2-7
2.4.1 Power-on method 2-7
2.4.1.1 If RCI is not used 2-7
2.4.1.2 If RCI is used 2-7
2.4.2 Power-off method 2-8
2.4.2.1 If RCI is not used 2-8
2.4.2.2 If RCI is used 2-8
2.5 Checking the Library and Drive Settings 2-9
2.5.1 Checking the drive settings 2-9
2.5.2 Checking the library settings 2-9
2.5.2.1 Checking the target ID setting 2-9
2.5.2.2 Checking the host WWPN setting 2-9
2.5.2.3 Checking the auto-cleaning function setting 2-9
2.5.2.4 Checking the auto-inventory function setting 2-9
2.5.2.5 Checking the auto-eject function setting 2-9
2.5.2.6 Checking the fast load function setting 2-10
2.5.2.7 Checking the time and date setting 2-10
2.5.2.8 Checking the remote panel settings 2-10
2.6 Checking the Host Settings 2-11

Chapter 3 Library Operation 3-1

3.1 Inserting and Ejecting a Cartridge (Data Cartridge) 3-1
3.1.1 Inserting/Ejecting a cartridge by opening the front door 3-2
3.1.2 Inserting/Ejecting cartridges from CAS 3-8
3.1.2.1 Inserting cartridges from CAS 3-8
3.1.2.2 Ejecting into CAS 3-8
3.2 Cleaning the Drive 3-9
3.3 Power to the unit 3-10
3.4 Turning on the server 3-11

Chapter 4 Operator Panel Operation 4-1

4.1 Overview of the Operator Panel 4-1
4.1.1 Touch-panel operation 4-1
4.1.2 Window type 4-3
4.1.2.1 Initialization window 4-3
4.1.2.2 Home window 4-3
4.1.2.3 Menu window 4-4
4.1.3 Window configuration 4-6
4.2 Referencing the Status of the Library/Drive 4-9
4.3 Referencing Library Information 4-11
4.3.1 Referencing cell cartridge information 4-11
4.3.1.1 Referencing general cell cartridge information 4-11
4.3.1.2 Referencing magazine cell cartridge information 4-12
4.3.1.3 Referencing cleaning cell cartridge information 4-13
4.3.1.4 Referencing reserve cell cartridge information 4-14
4.3.1.5 Referencing diagnostics cell cartridge information 4-16
4.3.2 Referencing information about the host interface 4-17
4.3.2.1 Referencing the Target ID and LUN of each adapter 4-17
4.3.2.2 Referencing the host WWPN permitted for each adapter 4-19

4.3.3 Referencing setup information for the library 4-20
4.3.4 Referencing information about the drive 4-20
4.3.5 Referencing setup information for the network 4-22
4.3.6 Referencing error information 4-22
4.3.6.1 Referencing hardware error information for the library 4-22
4.3.6.2 Referencing hardware error information for the drive 4-23
4.3.6.3 Referencing alarm error information 4-24
4.3.7 Referencing the version number of the library/drive 4-24
4.4 Setting the Target ID of the Drive 4-25
4.5 Setting Library Information 4-28
4.5.1 Setting information about the host interface 4-28
4.5.1.1 Setting the library Target (Loop) ID for each adapter 4-28
4.5.1.2 Setting the host WWPN permitted for each adapter (If needed) 4-31
4.5.1.3 Registering a host WWPN list 4-33
4.5.1.4 Deleting from the WWPN list 4-33
4.5.2 Setting library information 4-34
4.5.3 Setting information about the network 4-35
4.5.4 Setting the clock 4-36
4.5.5 Setting the screen saver 4-38
4.6 Opening the Magazine Door 4-39
4.7 Loading/Unloading a Cartridge 4-41
4.7.1 Loading a cartridge contained in the magazine into the drive 4-41
4.7.2 Unloading a cartridge loaded from the magazine 4-42
4.8 Cleaning the Drive Manually 4-43
4.9 Inserting/Ejecting a Cleaning Cartridge 4-45
4.9.1 Inserting a cleaning cartridge 4-45
4.9.2 Ejecting a cleaning cartridge 4-46
4.10 R 4-48
4.11 Releasing the Front Door Open Status 4-50
4.12 Unloading a Cartridge Loaded from the Host 4-51
4.13 Making an Inventory 4-52

Chapter 5 Remote Panel Operation 5-1

5.1 Overview 5-1
5.1.1 Login method 5-3
5.1.2 Frame configuration 5-6
5.1.3 Menu tree 5-7
5.2 Referencing the Status of Drive/Library 5-8
5.3 Referencing Library Information 5-12
5.3.1 Referencing information about the cartridge in the cell 5-12
5.3.1.1 Referencing the general cell 5-13
5.3.1.2 Referencing the magazine cell 5-16
5.3.1.3 Referencing the drive cell 5-17
5.3.1.4 Searching using the bar code label 5-18
5.3.2 Referencing setup information for the host interface 5-19
5.3.3 Referencing setup information for the library 5-22
5.3.4 Referencing setup information for the drive 5-23
5.3.5 Referencing setup information for the network 5-24
5.3.6 Referencing error history information 5-25
5.3.7 Referencing the firmware version number 5-27
5.3.8 Referencing setup information for e-mail 5-28
5.3.9 Referencing setup information for SNMP 5-30
5.4 Setting Target ID of the Drive 5-31
5.5 Setting Library Information 5-32
5.5.1 Setting information about the host interface 5-32
5.5.2 Setting library information 5-34
5.5.3 Setting information about the network 5-35
5.5.4 Setting the clock 5-36

5.5.5 Setting the e-mail function 5-38
5.5.6 Setting the SNMP agent 5-40
5.5.7 Changing the password 5-42
5.6 Operating the Library 5-43
5.6.1 Cleaning the drive manually 5-43
5.6.2 Operating the trace file 5-45
5.6.3 Saving setup information for the library/drive 5-46
5.6.4 Restoring setup information for the library/drive 5-49
5.6.5 Executing an SNMP trap test 5-50

Chapter 6 Troubleshooting 6-1

6.1 Drive/Library Maintenance 6-1
6.1.1 Procedure for the drive maintenance 6-1
6.1.2 Procedure for the library maintenance 6-1
6.2 Removing Cartridges when an Error Occurs 6-2
6.2.1 Removing cartridges from the hand mechanism when the robot fails 6-2
6.2.2 Removing cartridges from CAS when the CAS external door cannot be opened 6-6
6.3 Error Status 6-7
6.3.1 Error type of the drive 6-7
6.3.2 Error type of the library 6-8
6.3.2.1 Hardware error of the library 6-8
6.3.2.2 Library alarm error 6-9
6.4 General Troubleshooting 6-10
6.4.1 Power 6-10
6.4.2 Connections 6-10
6.4.3 Cartridge 6-11
6.4.4 CAS 6-11
6.4.5 Compatibility 6-11
6.4.6 Library performance 6-12
6.4.7 Cleaning 6-12
6.4.8 Operator panel 6-12
6.4.9 Remote panel 6-13

Chapter 7 Cartridge Media and Bar Code Label Specifications 7-1

7.1 Ultrium Cartridge Information 7-1
7.2 Replacement Period 7-2
7.3 Handling the Tape cartridge 7-3
7.3.1 Notes on storage 7-3
7.3.2 Notes on transportation 7-3
7.3.3 Notes on handling 7-4
7.3.4 Notes on the reader pin 7-4
7.3.5 Notes on label affixing 7-4
7.4 Bar Code Label Specification and Handling 7-5
7.4.1 Specifying the label string 7-5
7.4.1.1 Specify the volume area 7-6
7.4.1.2 Deleting the media area 7-6
7.4.1.3 Specifying the label for cleaning cartridge 7-6
7.4.2 Notes on label affixing 7-6
7.5 Precautions to Follow when Using the Cartridge 7-7

Appendix A Model Configuration A-1

A.1 Model Configuration of Basic Model A20 (10 drive options/98 cell options/10 CASs) A-2
A.2 Model Configuration of Basic Model A20 (10 drive options/182 cell options/10 CASs) A-3

A.3 Model Configuration of Basic Model A20 (10 drive options/221 cell options/10 CASs) A-4
A.4 Model Configuration of Basic Model A32 (16 drive options/89 cell options/10 CASs) A-5
A.5 Model Configuration of Basic Model A32 (16 drive options/167 cell options/10 CASs) A-6

Appendix B Technical Specifications B-1

B.1 Library/Drive Specifications B-1
B.1.1 Model A20 specification (drive: 1 to 10 units installed) B-1
B.1.2 Model A32 specification (drive: 1 to 16 units installed) B-2
B.1.3 Installed tape drive specification B-4
B.2 Environment Specifications B-5

Glossary GL-1

Index IN-1

Illustrations

Figure

Figure 1.1 Appearance (front) 1-1
Figure 1.2 Appearance (rear) 1-2
Figure 1.3 Appearance (rear: with the open rear door) 1-3
Figure 1.4 Appearance (isometric view from left: with left side board removed) 1-3
Figure 1.5 Hand mechanism 1-4
Figure 1.6 Robot appearance 1-6
Figure 1.7 Configuration diagram of the standard model components 1-7
Figure 1.8 CAS mechanism appearance 1-10
Figure 1.9 Magazine insertion method 1 1-12
Figure 1.10 Magazine insertion method 2 1-13
Figure 1.11 Magazine insertion method 3 (magazine regular position) 1-14
Figure 1.12 Magazine ejection method 1-15
Figure 1.13 Figure for explaining the magazine mechanism 1-16
Figure 1.14 Figure for explaining cartridge insertion method a 1-17
Figure 1.15 Figure for explaining cartridge insertion method b 1-18
Figure 1.16 Drive module appearance 1-19
Figure 1.17 Front door 1-21
Figure 1.18 Internal door 1-23
Figure 1.19 Internal door (when open) 1-24
Figure 1.20 Rear door 1-25
Figure 1.21 Rear door (when open) 1-26
Figure 1.22 LED sections (device rear view) (1/2) 1-27
Figure 1.22 LED sections (device rear view) (2/2) 1-28
Figure 1.23 Cable insertion port (Lower part on the rear side of the device) 1-28
Figure 1.24 SNMP function 1-36

Figure 2.1 Space required for library installation 2-2
Figure 2.2 Removing transport metal brackets 2-3
Figure 2.3 Fiber channel wiring methods 2-5
Figure 2.4 Power switch (power-on) 2-7
Figure 2.5 Power switch (power-off) 2-8

Figure 3.1 Cartridge insertion direction 3-3
Figure 3.2 Picker mechanism protruding from the hand mechanism 3-5
Figure 3.3 Picker mechanism that has been completely inserted into the hand mechanism 3-5
Figure 3.4 Hand mechanism placed on the right edge 3-6
Figure 3.5 Hand mechanism placed on the left edge 3-6
Figure 3.6 Parts requiring grease in the robot 3-7

Figure 4.1 Initialization window 4-3
Figure 4.2 Home window 4-4
Figure 4.3 Menu window 4-4
Figure 4.4 Configuration of home window and menu window 4-6
Figure 4.5 Selecting the [Cell Map] button 4-11
Figure 4.6 Cartridge information reference window for general cells 4-12

Figure 4.7 Reference window for magazine cell cartridge information 4-13
Figure 4.8 Reference window for cleaning cell cartridge information 4-14
Figure 4.9 Reference window for reserve cell cartridge information 4-15
Figure 4.10 Cartridge information reference window for diagnostic cell.....4-16
Figure 4.11 Selecting the [Host I/F] button 4-17
Figure 4.12 Host interface information reference window (When the Fabric connection is set) 4-18
Figure 4.13 Host interface information reference window (When the AL connection/Hard address are set).....4-18
Figure 4.14 Host interface information reference window (When the AL connection/Soft address are set) 4-19
Figure 4.15 Drive information reference window (When the Soft address is set) 4-21
Figure 4.16 Drive information reference window (When the Hard address is set).....4-21
Figure 4.17 Hardware error information display window of the library.....4-23
Figure 4.18 Hardware error information display window of the drive 4-23
Figure 4.19 Selecting the [Drive] button 4-25
Figure 4.20 Target (LOOP) ID setup window of the drive.....4-26
Figure 4.21 Selecting the [Host I/F] button. 4-28
Figure 4.22 Selecting the [Target ID] button.....4-29
Figure 4.23 LOOP ID setup window of the host 4-30
Figure 4.24 Selecting the [Host WWPN] button 4-31
Figure 4.25 Host WWPN setting window 4-32
Figure 4.26 Host WWPN list registration window.....4-33
Figure 4.27 Selecting the [CAS] button.....4-39
Figure 4.28 Selecting the [CAS Open] button.....4-39
Figure 4.29 Home window displaying a library hardware error.....4-48
Figure 4.30 Home window displaying a drive hardware error 4-49
Figure 4.31 Selecting the [Reset] button 4-49
Figure 4.32 Selecting the [Manual Eject] button.....4-51
Figure 4.33 Selecting the [Inventory] button.....4-52

Figure 5.1 Remote panel starting window.....5-2
Figure 5.2 Login window 5-3
Figure 5.3 Window displayed when the login fails 5-4
Figure 5.4 Window displayed for duplicate login 5-5
Figure 5.5 Frame configuration of the remote panel 5-6
Figure 5.6 Status reference window of the drive/library 5-8
Figure 5.7 Normal window display (no errors) (upper frame) 5-9
Figure 5.8 Window display when there is an error (upper frame).....5-9
Figure 5.9 Cell map window 5-12
Figure 5.10 General cell cartridge information display window 5-13
Figure 5.11 Magazine cell cartridge information display window 5-16
Figure 5.12 Drive cell cartridge information display window.....5-18
Figure 5.13 Bar code label search window.....5-19
Figure 5.14 Host interface setup information display window.....5-20
Figure 5.15 Library setup information display window 5-22
Figure 5.16 Drive setup information display window 5-23
Figure 5.17 Network setup information display window 5-24
Figure 5.18 Error history display window.....5-25
Figure 5.19 Firmware version number display window 5-27
Figure 5.20 E-mail setup information display window 5-28
Figure 5.21 SNMP setup information display window 5-30
Figure 5.22 Drive setup window 5-31
Figure 5.23 Adapter selection window.....5-32
Figure 5.24 Host interface setting window.....5-33
Figure 5.25 Library information setting window.....5-34
Figure 5.26 Network information setting window.....5-35
Figure 5.27 Date/time setting window.....5-37

Figure 5.28 E-mail function setting window 5-38
Figure 5.29 SNMP agent setting window 5-40
Figure 5.30 Password change window 5-42
Figure 5.31 Manual cleaning operation window 5-44
Figure 5.32 Trace file operation window 5-45
Figure 5.33 Library/drive setup information save window 5-46
Figure 5.34 Confirming that library/drive setup information has been downloaded 5-47
Figure 5.35 Completion of saving setup information for the library/drive 5-48
Figure 5.36 Specifying a file from which setup information for the library/drive should be restored 5-49
Figure 5.37 SNMP trap test start window 5-50
Figure 5.38 SNMP trap transmission completion window 5-51

Figure 6.1 Hand mechanism 6-2
Figure 6.2 Procedure 1 for removing cartridges 6-3
Figure 6.3 Procedure 2 for removing cartridges 6-3
Figure 6.4 Procedure 3 for removing cartridges 6-4
Figure 6.5 Procedure 4 for removing cartridges 6-5
Figure 6.6 Unlocking the external door of CAS 6-6
Figure 6.7 Operator panel window when a hardware error occurred in the drive 6-7
Figure 6.8 Operator panel window when a hardware error of the library occurs 6-8
Figure 6.9 Operator panel window when a library alarm error occurs 6-9

Figure 7.1 LTO Ultrium 1 tape cartridge 7-2
Figure 7.2 Bar code label string 7-5
Figure 7.3 Bar code label affixing location 7-6

Figure A.1 Model Configuration of Basic Model A20 (10 drive options/98 cell options/10 CASs) A-2
Figure A.2 Model Configuration of Basic Model A20 (10 drive options/182 cell options/10 CASs) A-3
Figure A.3 Model Configuration of Basic Model A20 (10 drive options/221 cell options/10 CASs) A-4
Figure A.4 Model Configuration of Basic Model A32 (16 drive options/89 cell options/10 CASs) A-5
Figure A.5 Model Configuration of Basic Model A32 (16 drive options/167 cell options/10 CASs) A-6

Table

Table 1.1 Configuration list of model elements 1-9
Table 1.2 Upgrade pattern (A20) 1-9
Table 1.3 Upgrade pattern (A32) 1-9

Table 4.1 Library status....4-9
Table 4.2 Drive/Cartridge....4-9
Table 4.3 Drive/cartridge status (added to the end of indications of library or drive statuses listed in Table 4.2)....4-10
Table 4.4 LOOP ID/ALPA correspondence table....4-27
Table 4.5 World time zones 4-37

Table 6.1 Error type of the drive 6-7

Table 7.1 Tape cartridge specifications....7-1
Table 7.2 Environment conditions for storing the tape cartridge 7-3
Table 7.3 Environment conditions for transporting the tape cartridge....7-3
Table 7.4 Usable characters....7-6

Table B.1 Model A20 specification B-1
Table B.2 Model A32 specification B-2
Table B.3 Tape drive specification B-4

Chapter 1 Overview

1.1 Device Configuration

1.2 Functional Overview

1.1 Device Configuration

1.1.1 Device outline

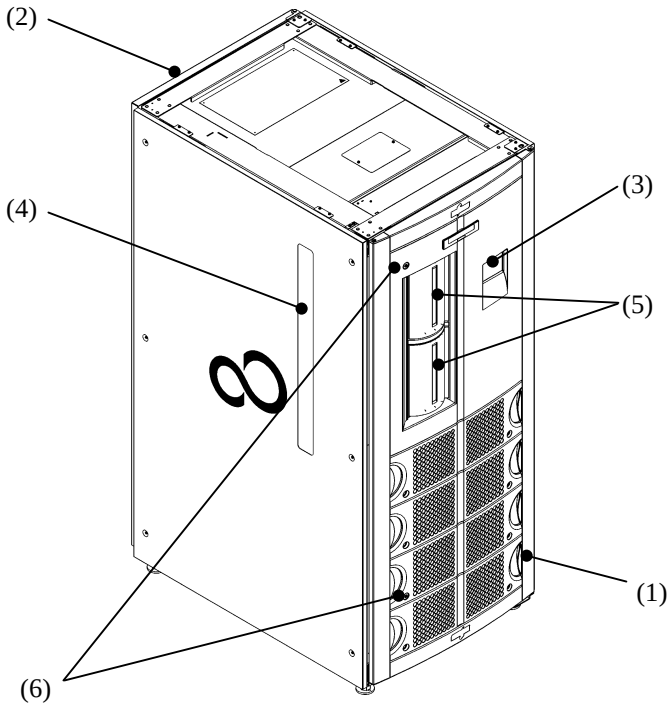


Figure 1.1 Appearance (front)

(1) Front door

(2) Rear door

(3) Operator panel

(4) Window

(5) CAS (Cartridge Access Station)

(6) Key

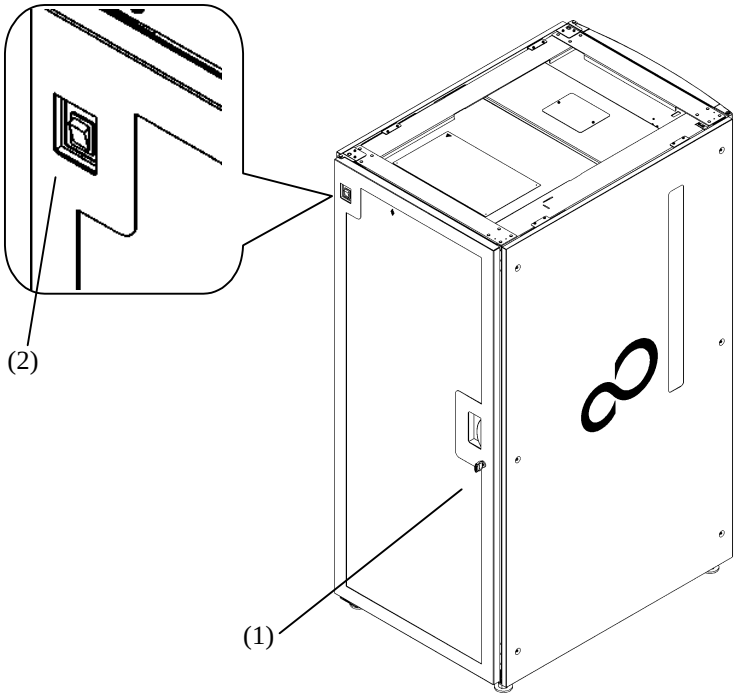


Figure 1.2 Appearance (rear)

(1) Key

(2) Power switch

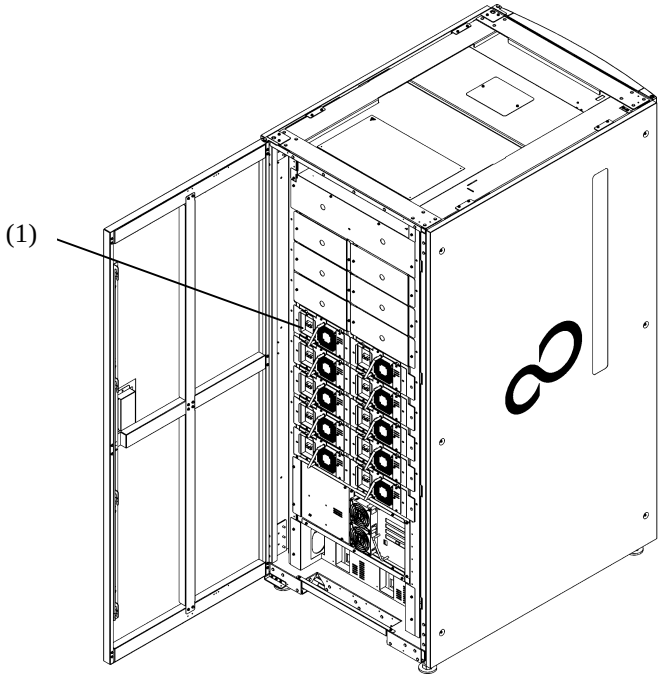


Figure 1.3 Appearance (rear: with the open rear door)

(1) Drive module

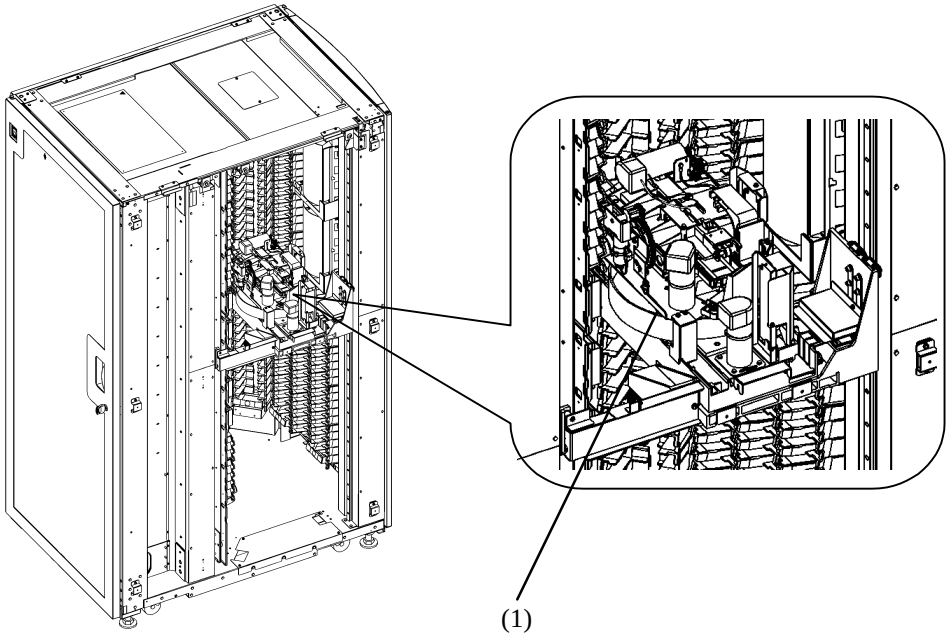


Figure 1.4 Appearance (isometric view from left: with left side board removed)

(1) Robot unit

1.1.2 Robot

The robot is used for transporting a tape cartridge from cell to cell, or from cell and CAS (See 1.1.4 "Cartridge Access Station (CAS)) to the drive". Figure 1.6 shows the appearance of the robot unit.

(1) Hand mechanism

Mechanism for ejecting or inserting cartridges from or into a cell, CAS, or drive. The hand mechanism contains the following mechanisms:

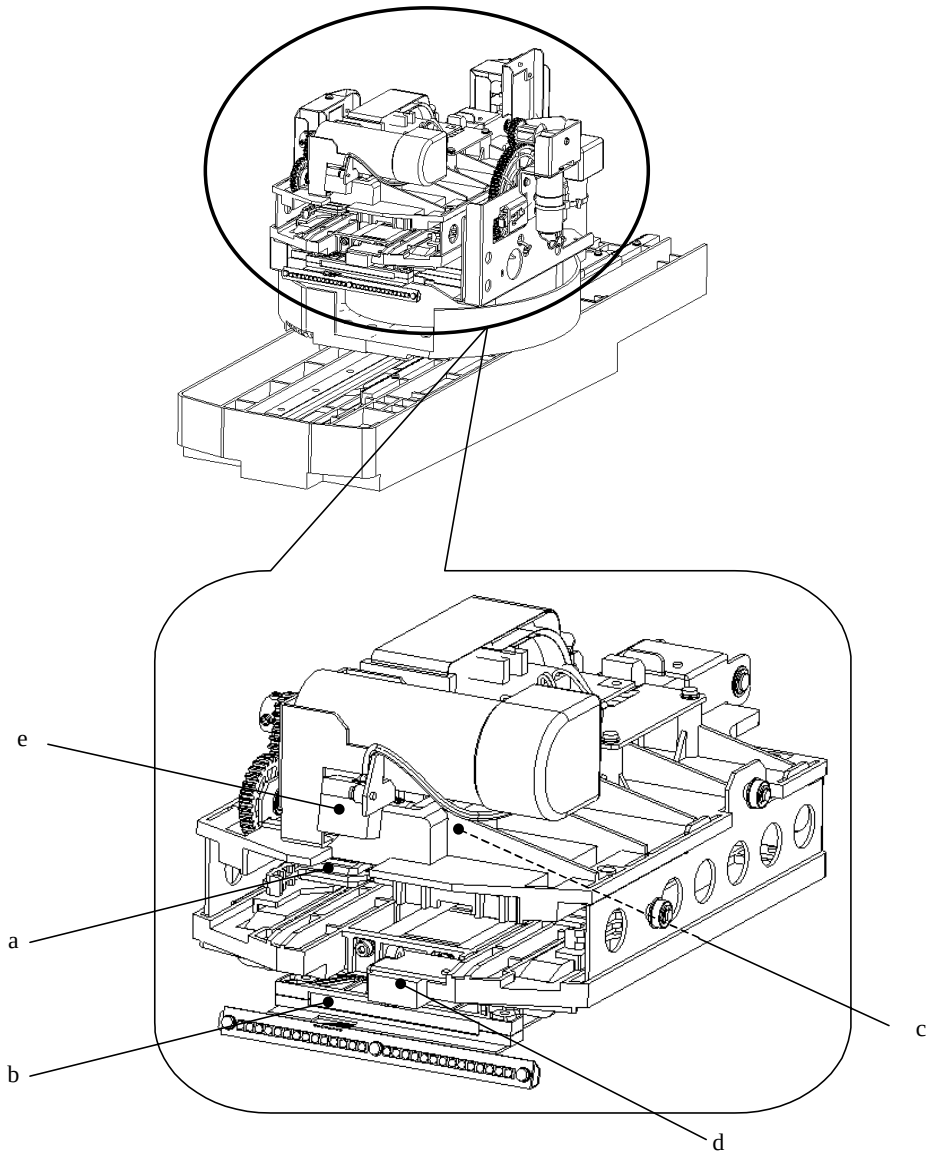


Figure 1.5 Hand mechanism

a. Picker mechanism: Holds a cartridge.

b. Bar code reader: Reads the bar code label affixed to a cartridge. Also detects the relative position of the robot.

c. CM reader: Reads the cartridge memory information contained in a cartridge.

d. CIC sensor: Identifies whether a cartridge is in the cell, CAS, or drive.

e. CIP sensor: Indicates whether there is a cartridge in the hand mechanism.

(2) Tilt mechanism

Mechanism for tilting the hand mechanism to 0 degree and 12 degrees. This is a mechanism for supporting the drive that is installed parallel to the cells that have a tilt of 12 degrees, to prevent cartridges from protruding due, for example, to an earthquake.

(3) Swivel mechanism

Mechanism for rotating the hand mechanism. It is possible to rotate the hand mechanism to match the orientation of the cell, CAS, and drive in the front, rear, and on both sides.

(4) X mechanism

Mechanism for operating the hand mechanism in the left/right direction. When the expanded locker is used, an expanded base can be mounted on the left of the X mechanism.

(5) Y mechanism

Mechanism for operating the robot unit vertically. A weight as heavy as the robot unit is mounted so that the robot unit can be moved vertically by hand (*1)

*1 The robot unit can be moved manually while it is turned off so that the robot can be set aside manually when, for example, numerous cartridges are inserted by opening the front door for device installation. However, be sure to exercise caution when handling it. See Section 3.1.1, "Inserting/Ejecting a cartridge by opening the front door."

Remarks:

When the device is installed, the robot unit is secured with metal brackets to prevent damage during transport. Before using the device, ask our maintenance personnel to remove the brackets. For more information about removing the brackets, see Section 2.1.2, "Removing the transport metal brackets."

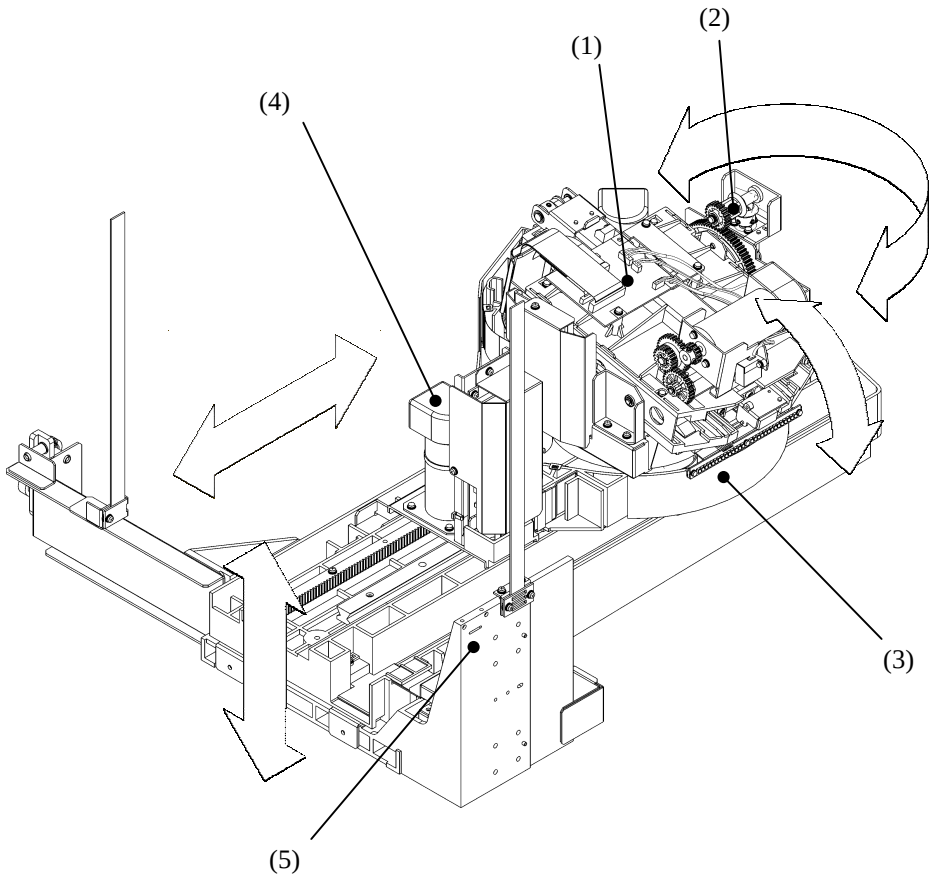


Figure 1.6 Robot appearance

(1) Hand mechanism (For details, see Figure 1.5)

(2) Tilt mechanism

(3) Swivel mechanism

(4) X mechanism

(5) Y mechanism

1.1.3 Each component of the library

This section explains the physical location of each element in the library, namely, the cell, drive, and CAS (Cartridge Access Station) and their element addresses.

Remarks:

For information on the configuration diagram of each model, see Appendix A, "Model Configuration."

1.1.3.1 Configuration of the basic model components

The following figure shows the physical location of each component of the basic model.

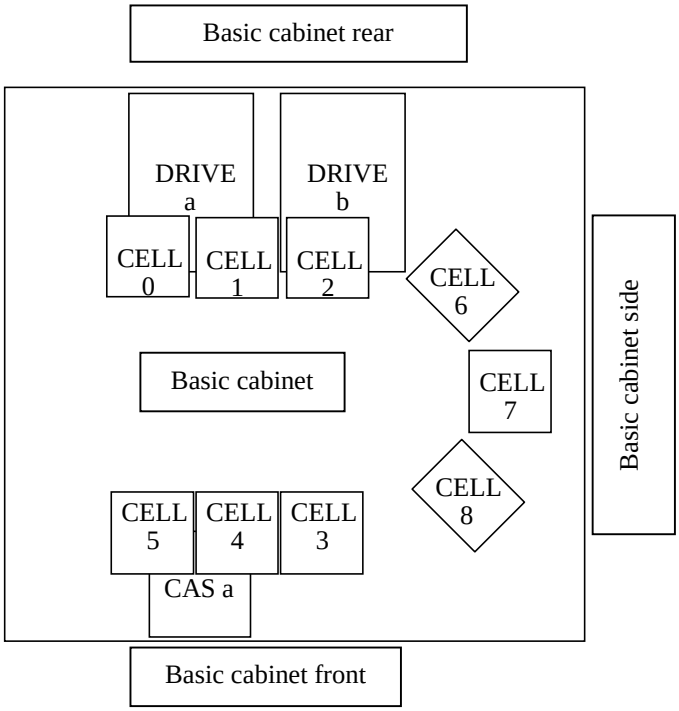


Figure 1.7 Configuration diagram of the standard model components

DRIVE: a and b are drive columns.

CAS: Cartridge Access Station.

CELL: The number is a column number.

1.1.3.2 Special cells

In the library, there are special cells that cannot be accessed from the host.

The number of cells of each type depends on the model.

- COLUMN - 5

  Includes the cleaning cell(5), replacement cell(1), reserve cell(2), and diagnostic cell(3).

- Cleaning cell

  The cartridge for drive head cleaning is stored here. The auto-cleaning function of the library and the manual cleaning function on the operator panel use a cleaning cartridge in this cell.

- Replacement cell

  This type of cell is used for temporarily storing a cartridge when a cartridge replacement request (Exchange Medium command) is made from the host.

- Reserve cell

  This type of cell is used for setting aside a cartridge when it cannot be stored in a cell in response to a cartridge mount request (Move Medium command) from the host. Open the front door to remove the cartridge set aside in the reserve cell.

  When a cartridge is set aside in the reserve cell, the "Exist In Reserve Cell" icon in the icon area of the operator panel lights.

- Diagnostic cell

  This type of cell stores a special cartridge for diagnostics.

⚠ Notes:

Never take out any special cartridge contained in the diagnostic cell because it is used by the maintenance personnel.

1.1.3.3 Configuration and upgrade pattern for each model

The following shows the component configuration and the upgradable configuration for each model.

Table 1.1 Configuration list of model elements

Locker	Model	Option		Number of CASs	Power supply used
		Number of cells	Number of drivers (max)		
Basic	A20	98	10	10	100/200V
		182			100/200V
		221			100/200V
	A32	89	16	10	200V
		167			200V

Table 1.2 Upgrade pattern (A20)

	Purchase model			
Purchase model	Model/cell/drive	A20/98/10	A20/182/10	A20/221/10
	A20/98/10		○	○
	A20/182/10	×		○
	A20/221/10	×	×	

Table 1.3 Upgrade pattern (A32)

	Purchase model		
Purchase model	Model/cell/drive	A32/98/10	A32/182/10
	A32/89/10		○
	A32/167/10	×	

Note: The A20 cannot be upgraded to the A32 model. The A32 model cannot be upgraded to the A20 model.

1.1.4 Cartridge Access Station (CAS)

CAS is a mechanism through which the operator inserts or ejects cartridges when the device is operating. A special magazine is used for inserting or ejecting cartridges and up to five volumes of cartridges can be inserted/ejected simultaneously for each CAS. CAS consists of the following mechanisms.

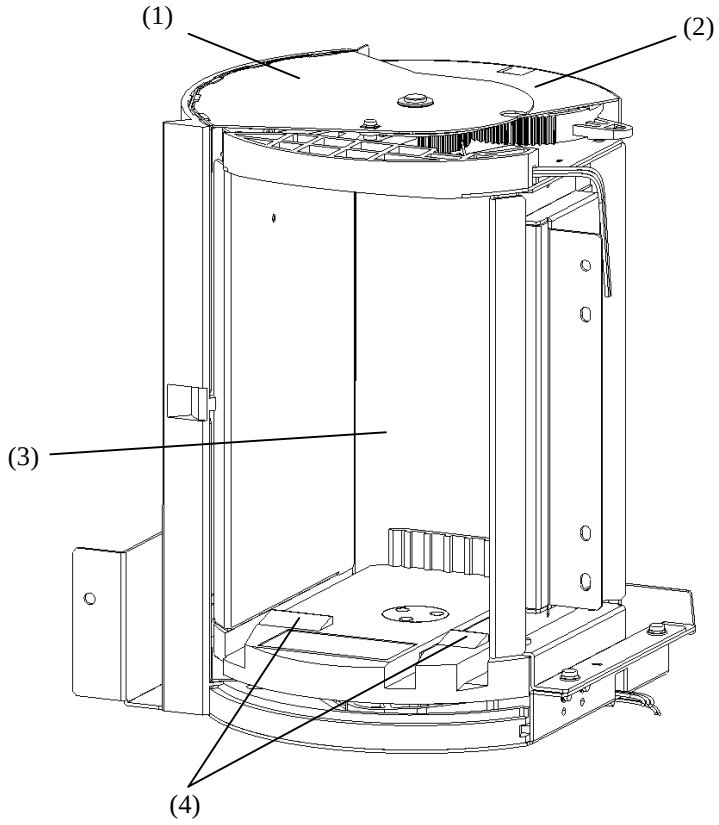


Figure 1.8 CAS mechanism appearance

(1) External door

Door that covers the magazine insertion/ejection port. The external door is normally locked by covering the magazine insertion/ejection port. The external door can be unlocked by using an operation from the operator panel so that a magazine can be inserted or ejected. By closing this door after inserting a magazine, an inventory of the magazine is made to manage information about cartridges in the magazine.

(2) Internal door

Safety door to screen off the operator from the device interior when no magazine is inserted in CAS

(3) Magazine insertion/ejection port

Port for inserting a magazine into the device or ejecting it from the device.

(4) Positioning projection

Projection with a tilt to position the magazine correctly in CAS

The following explains how to insert and eject a magazine using CAS.

1.1.4.1 Inserting a magazine from CAS

1) After the CAS external door is unlocked with an operation from the operator panel, the external door opens slightly. By hand, gently open the external door to the left until you hear a click.

2) Holding the handle on the rear of the magazine, insert the magazine from the magazine insertion port into the CAS and push it into its normal position.

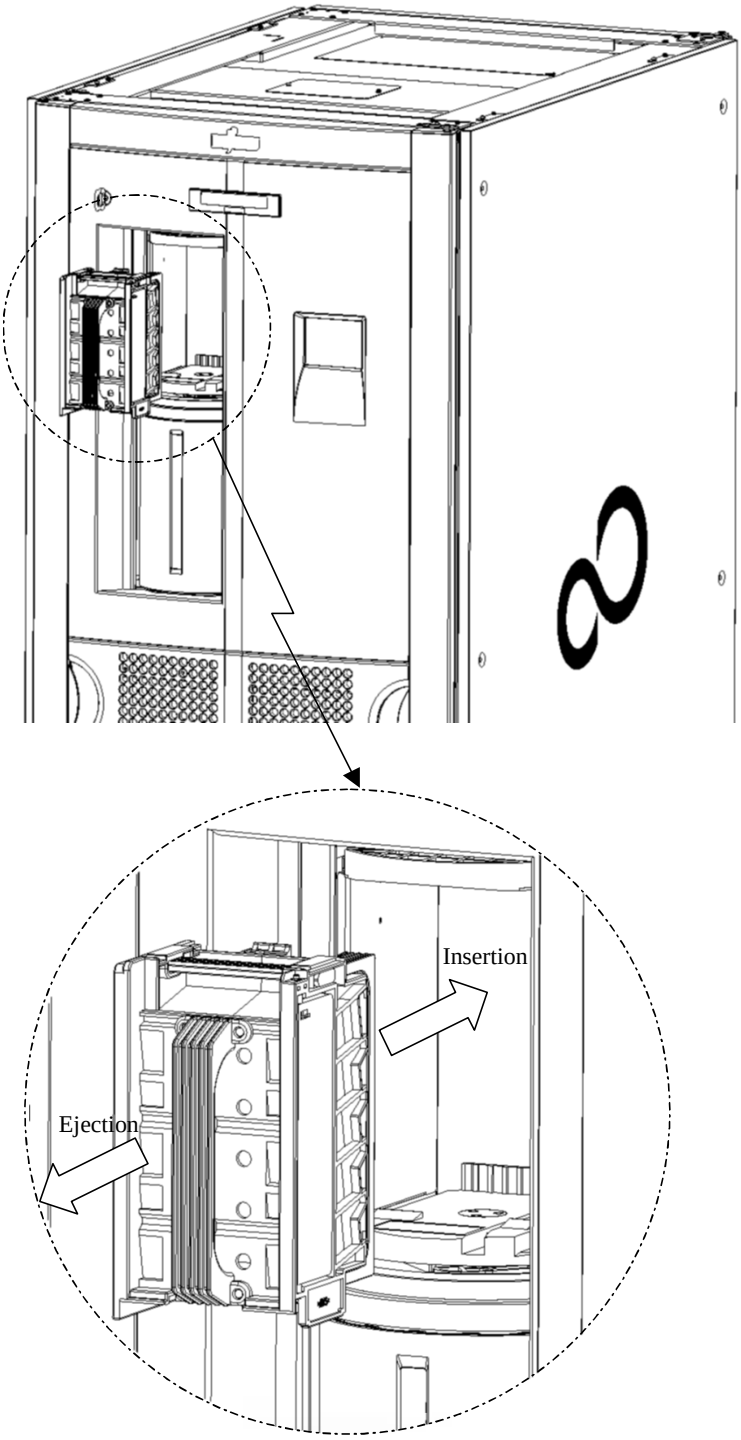


Figure 1.9 Magazine insertion method 1

3) Make sure that the magazine is in its regular position and then close the external door until it is locked.

⚠ Notes:

The magazine is tilted while pushing it into CAS so that it rests on the positioning projection (Figure 1.10). If the magazine is pushed further, it is completely over the positioning projection (Figure 1.11). This state in which the magazine is pushed in completely is its regular position. Always push the magazine into this position. The external door is constructed so that it cannot be closed if the magazine is not in its regular position.

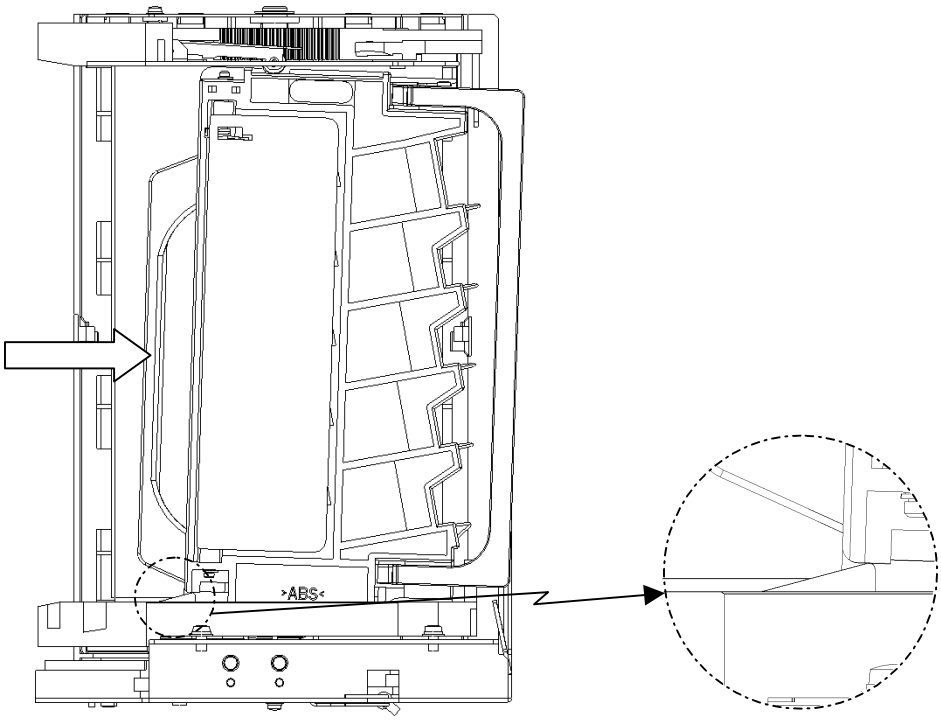


Figure 1.10 Magazine insertion method 2

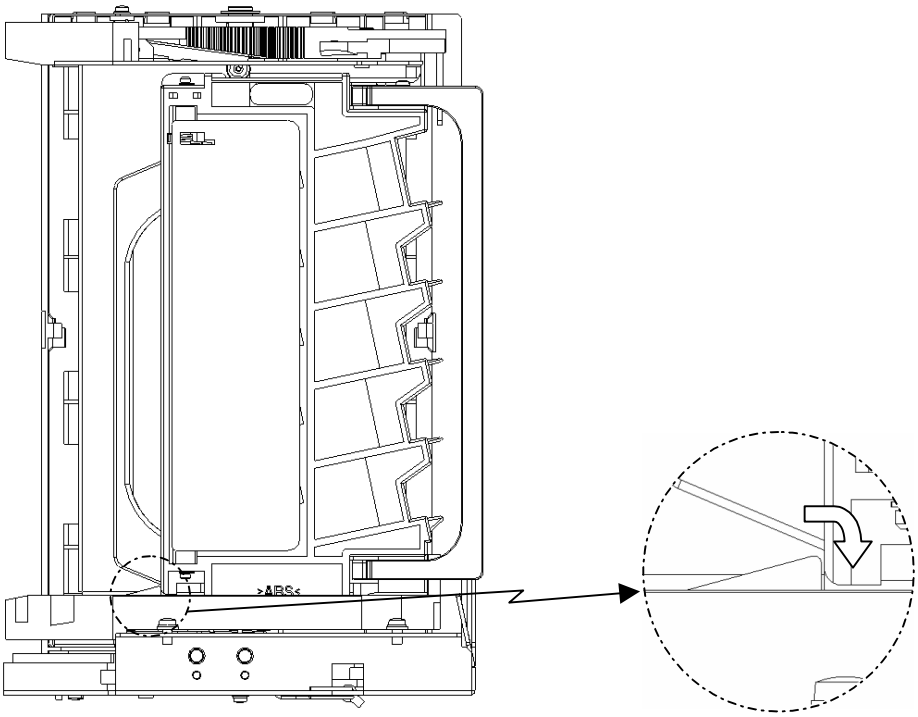


Figure 1.11 Magazine insertion method 3 (magazine regular position)

1.1.4.2 Ejecting a magazine from CAS

1) After the CAS external door is unlocked with an operation from the operator panel, the external door opens slightly. By hand, gently open the external door to the left until you hear a click.

2) Hold the handle on the rear side of the magazine inside CAS, lift the handle by holding it so that the magazine front is pointing downward and the bottom on the rear side is lifted (Figure 1.12). In this state, pull the handle out from the device.

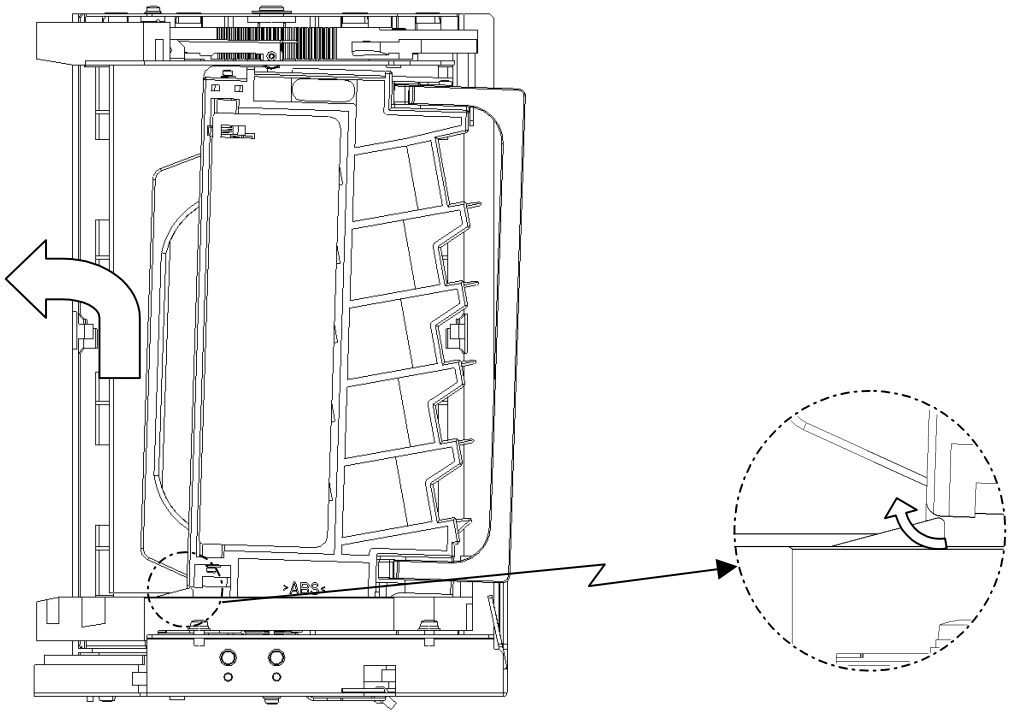


Figure 1.12 Magazine ejection method

3) Pull the magazine out completely from CAS by pulling the handle still further.

1.1.5 Magazine

The magazine is used as a shelf unit for receiving/delivering cartridges inside CAS when the operator inserts/ejects cartridges via CAS. The magazine has a 5-shelf unit for storing cartridges and up to five volumes of cartridges can be inserted/ejected simultaneously from CAS.

Remarks:

The library has two CASs, each of which can hold five-volume magazines.

A magazine consists of the following mechanisms:

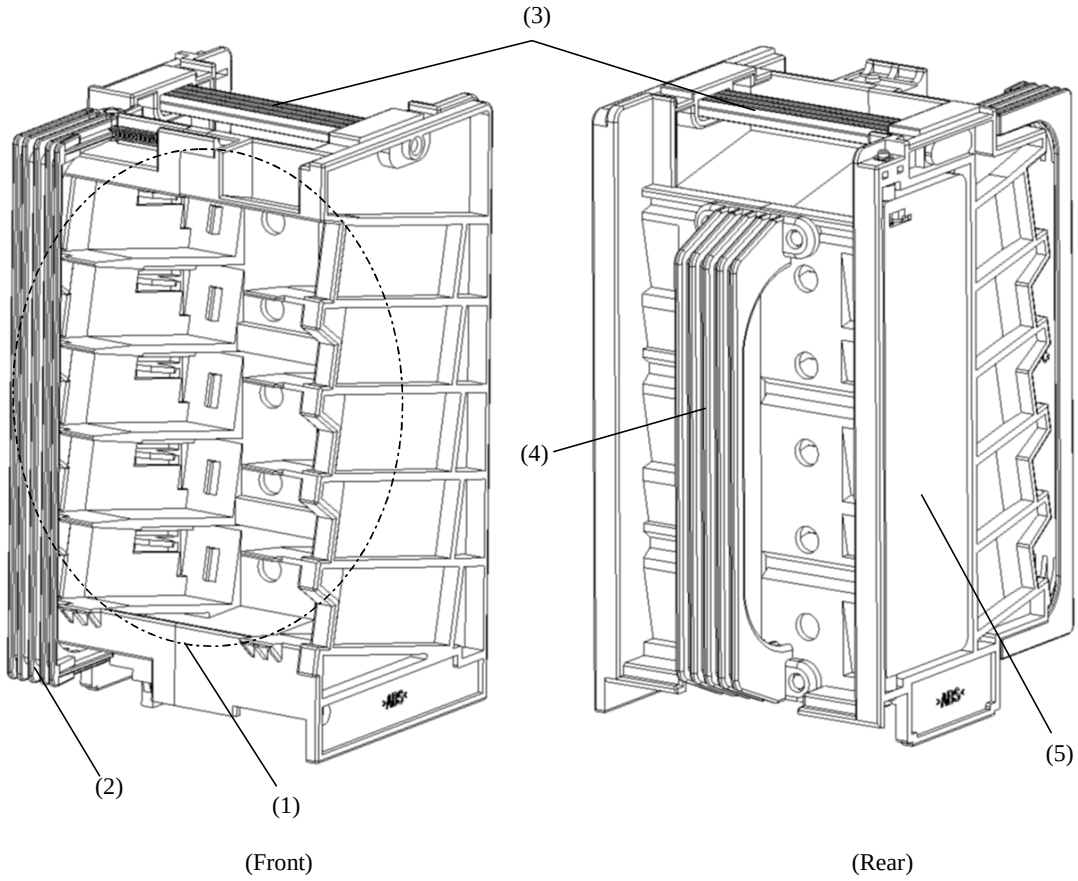


Figure 1.13 Figure for explaining the magazine mechanism

(1) Cartridge storage shelf unit

This shelf unit, comprising five shelves, can store up to five volumes.

(2) Cartridge drop prevention lever

This lever prevents cartridges from dropping from the magazine when carrying it.

(3) Transport handle

This handle is used for holding the magazine during transportation.

(4) CAS insertion/ejection handle

This handle is used for pushing in/pulling out the magazine at insertion into or ejection from CAS.

(5) Lever for preventing cartridges from being inserted backwards

Lever to keep cartridges from being inserted backwards. If an attempt is made to insert a cartridge into the magazine with the cartridge having the wrong orientation, this lever is extended, making insertion into the CAS physically impossible.

1.1.5.1 Inserting cartridges into the magazine

1) Rotate the cartridge drop prevention lever counterclockwise as viewed from the direction in which cartridges will be inserted.

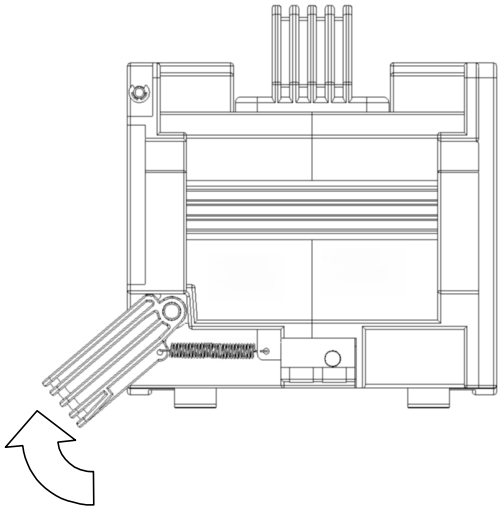


Figure 1.14 Figure for explaining cartridge insertion method a

2) Insert the cartridge into the magazine using the other hand while maintaining the above state.

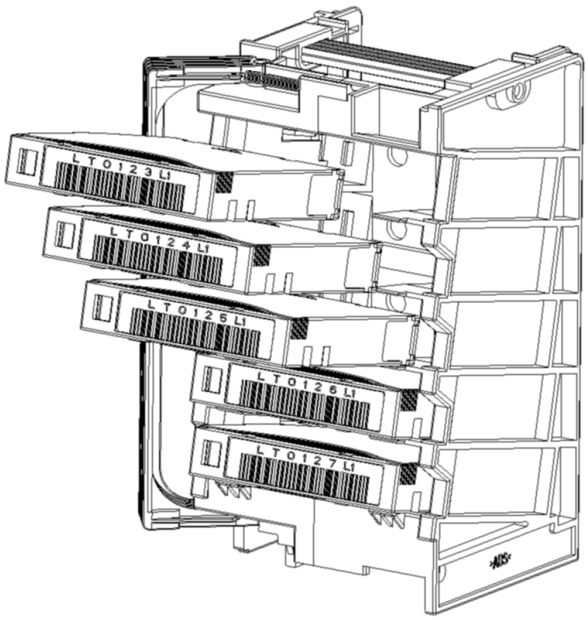


Figure 1.15 Figure for explaining cartridge insertion method b

*	Orientation of cartridges during insertion Set the orientation of the magazine so that the bar code label affixed to the cartridge rear side faces the front of the magazine and the bottom (surface with the hub) of the cartridge is pointing downward. Do this when the cartridge storage shelf unit is facing the front of the cartridge and the handle for transportation is pointing upward (Figure 1.15). If not set in the correct orientation, the lever for keeping the cartridge from being inserted backwards is extended, preventing insertion of the magazine into CAS. In this case, set the cartridge so that its orientation is correct.

1.1.5.2 Ejecting cartridges from the magazine

1) Hold the magazine by one hand and then rotate the cartridge drop prevention lever using the same hand.

Remarks:

Keep in mind the orientation of the magazine because cartridges will drop if the cartridge storage shelf unit is oriented downward.

2) Remove the cartridge using the other hand while maintaining the above state.

1.1.6 Drive module

The drive module is a module unit that contains the drive for recording data, drive power supply, and external interface. When, for example, a drive fails, maintenance replacement is carried out in units of drive modules. The host interface supports the fiber channel.

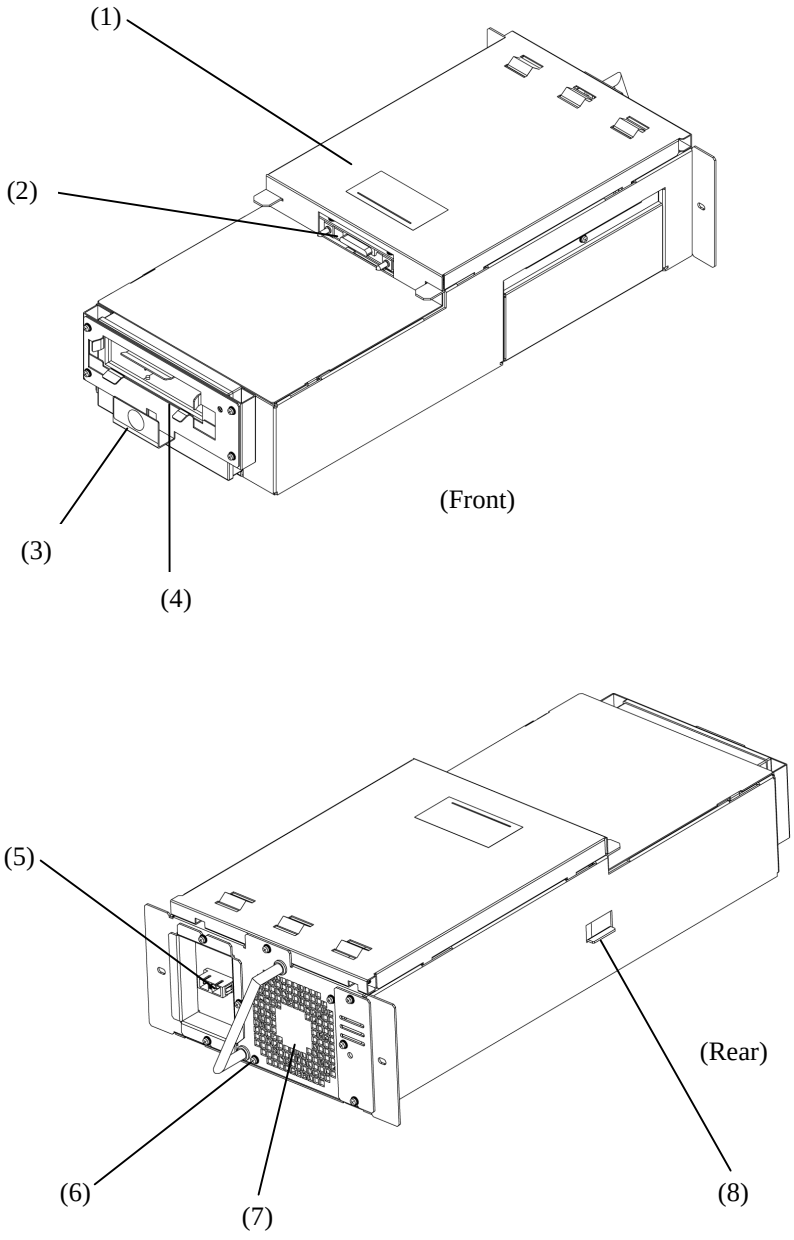


Figure 1.16 Drive module appearance

(1) CAUTION label

A note label for drop prevention when removing drive modules from the device for maintenance replacement

(2) Connection connector

Connector for connecting a drive module and the main unit of the device. This connector is used for information management and power supply of the drive.

(3) Relative position flag

Mark for inserting cartridges into the drive with the robot.

Remarks:

Note that the robot may not be able to insert cartridges into the drive correctly due to deformation or dust adherence.

(4) Drive

Drive for recording data. The drive may fail if anything other than cartridges (e.g., a hand) is inserted into the CTG insertion port when handling the drive module.

(5) Interface

Port for the fiber channel interface.

(6) Handle

Handle used for removing or transporting drive modules.

(7) Fan

Fan for cooling the interior of the drive module

(8) Stopper for drop prevention

Stopper for preventing the drive module from dropping when pulling it out from the device for drive module maintenance, etc.

⚠ CAUTION

Injury: Never move your hands away from the drive module until it is placed in a safe place. Otherwise, the drive module may drop, causing injury if you move your hands away from it after pulling it out beyond this stopper.

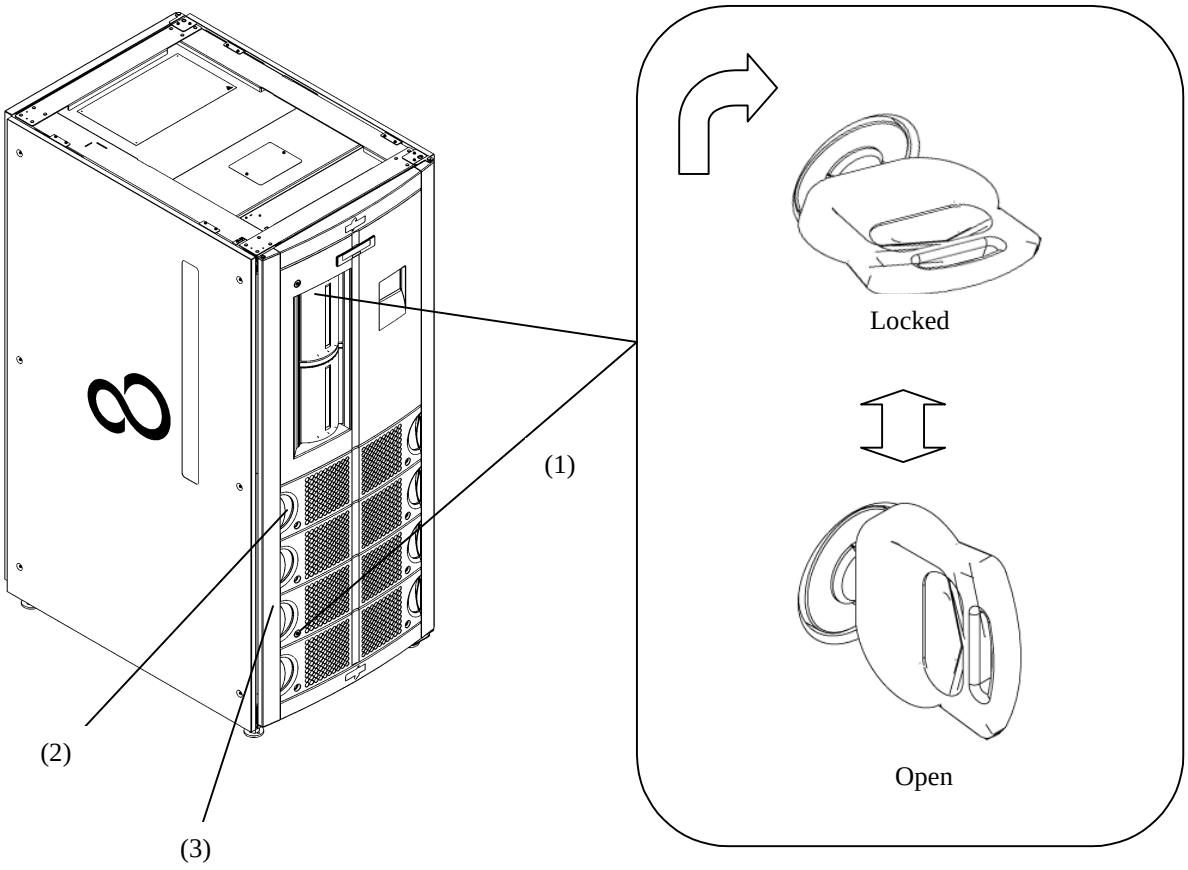
1.1.7 Opening/Closing the door

The following explains how to open and close the front door, internal door, and rear door.

⚠ CAUTION

Damage on the library and electrical shock:
Be sure to open and close the front door and internal door after making sure that the device is turned off.

1.1.7.1 Opening and closing the front door



(1) Key

(2) Handle

(3) Aluminum part

Figure 1.17 Front door

(1) Opening the front door

1) Turn to the open position the keys in the locked position at the upper and lower parts of the front door (two locations).
2) Open the front door by pulling the handle out.

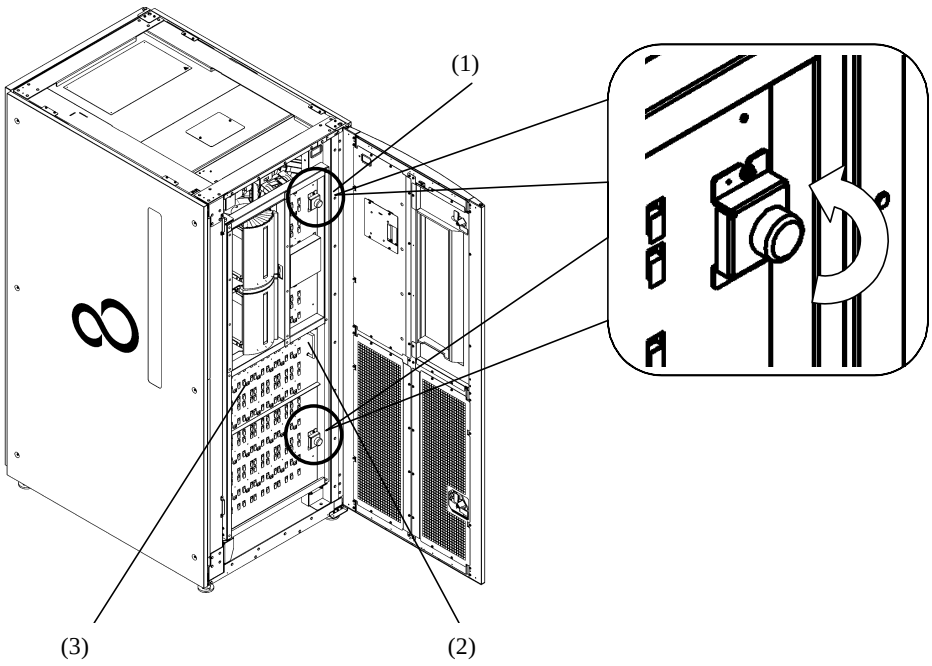
(2) Closing the front door

1) Close the front door by pressing the aluminum part at the left end of the front door.
2) Turn the keys from the open position to the locked position (two locations) at the upper and lower parts of the front door.

Remarks:

1. When opening or closing the front door, do not hold any part other than the handle and aluminum part.
2. Open and close the front door slowly.
3. When closing the front door, make sure that the two keys are in the locked position.

1.1.7.2 Opening and closing the internal door



(1) Thumbscrew

(2) Handle

(3) Internal door

Figure 1.18 Internal door

(1) Opening the internal door

1) Keep the front door open.
2) Rotate the thumbscrews at the upper and lower parts of the door counterclockwise until they come off.
3) If the two screws come off, pull the handle out to open the internal door (Figure 1.19).

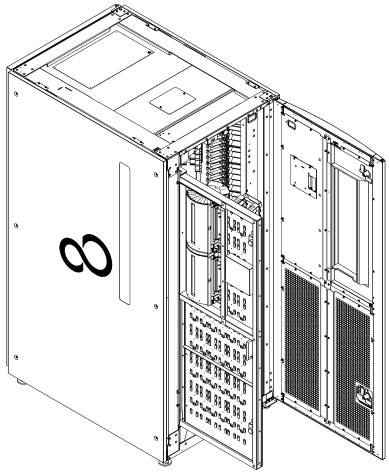


Figure 1.19 Internal door (when open)

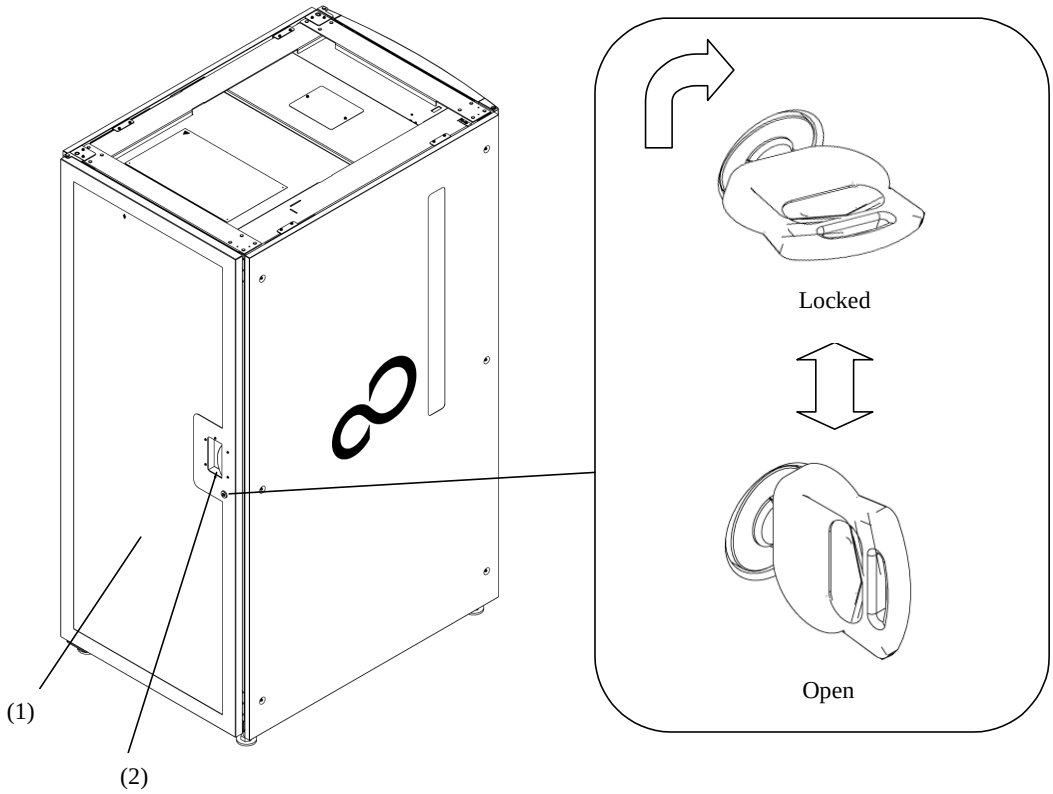
(2) Closing the internal door

1) Push the handle slowly to close the internal door.
2) Fully secure the internal door by rotating the thumbscrews at the upper and lower parts of the door clockwise.

Remarks:

1. When opening or closing the door, do not hold any part other than the handle.
2. Open or close the internal door slowly. If the internal door is opened or closed abruptly or such that it is subjected to physical shock, cartridges mounted inside the internal door may be knocked out of it.
3. When closing the internal door, secure the internal door firmly with two thumbscrews. If the internal door is not fully closed, the robot may not be able to correctly transport cartridges.

1.1.7.3 Opening and closing the rear door



(1) Rear door

(2) Handle

Figure 1.20 Rear door

(1) Opening the rear door

1) Turn the rear door key from the locked position to the open position.
2) Pull the handle out to open the rear door (Figure 1.21).

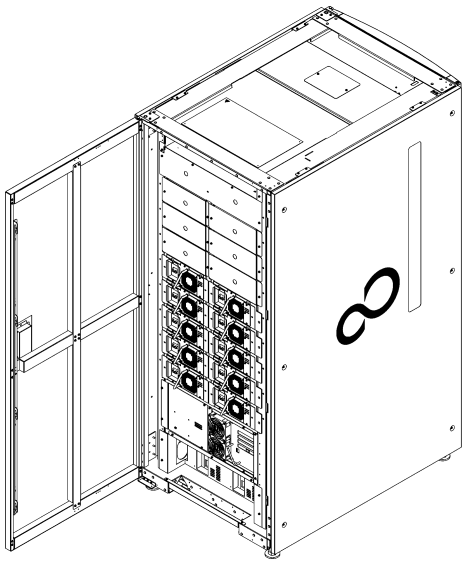
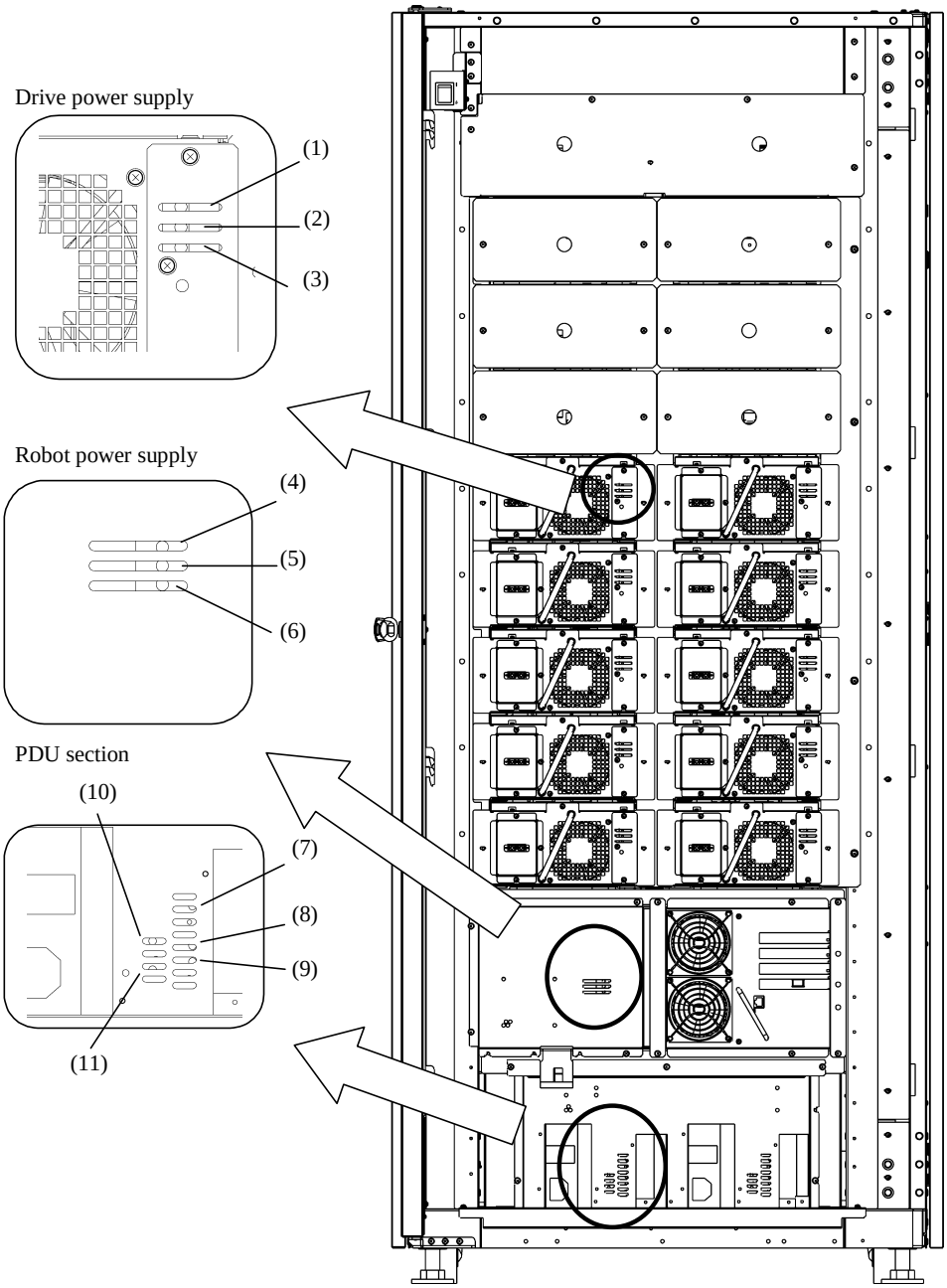


Figure 1.21 Rear door (when open)

(2) Closing the rear door

1) Close the rear door slowly and turn the key to the locked position.

1.1.8 Hardware module (interface card, power supply, and BCR)



Remarks:

- Drive power supply

(1) Power ON (green)

(2) Power ALARM (orange)

(3) Fan ALARM (orange)

Figure 1.22 LED sections (device rear view) (1/2)

- Robot power supply
  - (4) Power ON (green)
  - (5) Power ALARM (orange)
  - (6) Fan ALARM (orange)
- PDU section
  - (7) Power ON (green)
  - (8) Robot side ALARM (orange)
  - (9) Drive side ALARM (orange)
  - (10) Robot side ON (green)
  - (11) Drive side ON (green)

Figure 1.22 LED sections (device rear view) (2/2)

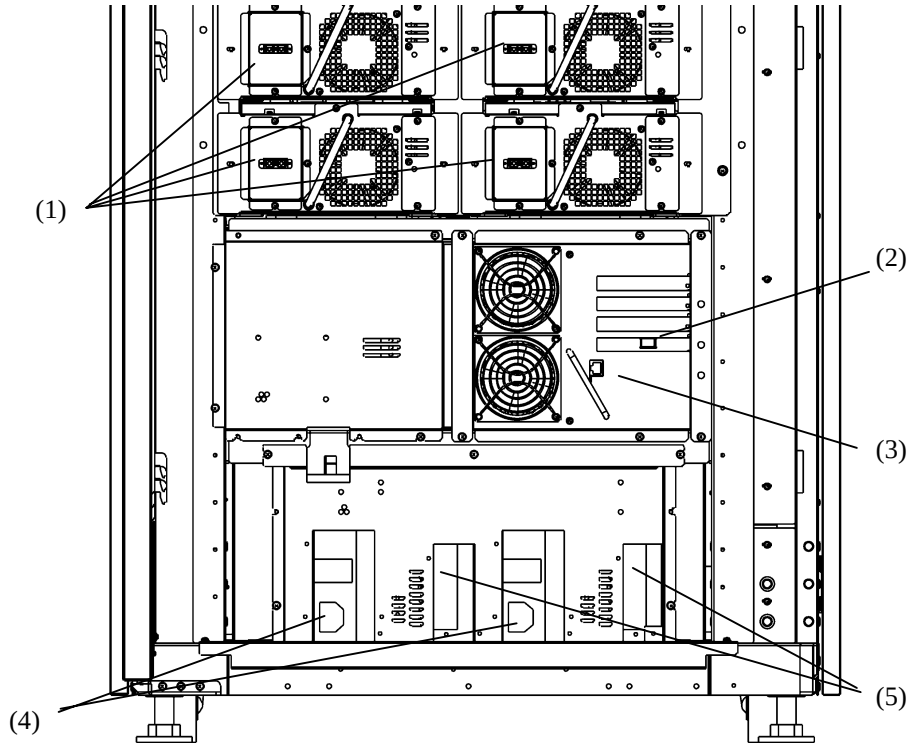


Figure 1.23 Cable insertion port (Lower part on the rear side of the device)

(1) Interface between HOST and drive (FC)

(2) Interface between HOST and library (FC)

(3) LAN

(4) AC inlet (100-200 V or 200 V)

(5) RCI

1.2 Functional Overview

This section explains the functions provided by the magnetic tape library device (referred to as the library hereafter).

1.2.1 FC control function

The library is controlled by software that controls a magnetic tape library device, such as backup software (collectively referred to as backup software hereafter).

The library is connected via the Fibre Channel (FC) interface to a server (such as Solaris and WindowsNT4.0/2000) on which the backup software is installed.

The backup software, through the Fibre Channel interface, requests the robot to transport cartridges to the drive or requests the drive to access data.

Remarks:

The library can have up to four connection ports for the SCSI or fiber channel cables. To add a connection port, consult with the maintenance person.

1.2.2 Fast load function

This is a function only for mounting a cartridge in response to a request from the host to mount a cartridge on the drive without waiting until the drive is ready.

The fast load function can be set from the operator panel. For details on how to set the function, see 4.5.2, "Setting library information."

Important:

Depending on the backup software, the fast load function may not be usable. For more information, check the backup software specifications (The factory default for the fast load function is "disabled").

Important:

If the fast load function is disabled, a timeout may occur for some kinds of backup software. Check the backup software that is being used to ensure that the timeout period can be changed.

1.2.3 Inventory function

This is a function for updating cartridge management information by reading the bar code labels affixed to the cartridges inside the library. The inventory function is used in the following cases:

- When the library is turned on (only if the auto-inventory function is "enabled")
- When the inventory is operated from the operator panel
- When the front door is opened and closed to insert or eject a large number of cartridges.

Remarks:

For details on how to make an inventory from the operator panel, see 4.13, "Making an inventory."

Auto-inventory function

This is a function for making an inventory as an initialization operation when the library is turned on.

Disabling the auto-inventory function can reduce the library startup time. However, if you insert or eject a cartridge with the front door open after turning off the library, the information is not automatically reflected in the management information of the library. If you use the library in this state, the library may malfunction (The factory default for the auto-inventory function is "enabled").

Remarks:

If you turn off the library, open the front door, and change the position of a cartridge that is not a CAS cartridge while the auto-inventory function is disabled, be sure to take inventory from the operator panel.

1.2.4 Manual load function

This is a function for loading cartridges directly to the drive from CAS or to unload them directly from the drive to CAS without using backup software.

To load a cartridge to the drive or to unload it from the drive manually, perform the Load/Unload operation on the operator panel.

Remarks:

1. For information on the method of inserting a magazine into CAS, see 3.1.2, "Inserting/Ejecting cartridges from CAS."
2. For information on the method of performing the Load/Unload operation from the operator panel, see 4.7, "Loading/Unloading a Cartridge."

1.2.5 Cleaning function

This library has both an automatic and a manual cleaning function for cleaning drives. Both functions use the cleaning cartridge stored in the cleaning cell.

Neither the auto-cleaning function nor the manual cleaning function can be used if there is no cleaning cartridge in the cleaning cell. If there is no cleaning cartridge in the cell, insert a cleaning cartridge from the CAS. This operation can be performed from the operator panel. For information on inserting a cleaning cartridge, see 4.9.1, "Inserting a cleaning cartridge."

Operation of the auto-cleaning function and manual cleaning function are described in the following sections.

1.2.5.1 Auto-cleaning function

If the library detects that the drive requires cleaning, the drive is automatically cleaned by using the cleaning cartridge in the cleaning cell.

Remarks:

1. It is necessary to "enable" the auto-cleaning function on the operator panel or remote panel.
2. If the auto-cleaning function is "disabled", auto-cleaning is not performed even if the drive requires cleaning.

   In that case, perform drive cleaning using the manual cleaning function or the cleaning function of the backup software.

Important:

Generally, the auto-cleaning function of the backup software is controlled by the processing time of the library. Therefore, cleaning more often than necessary may be done, causing the cleaning cartridge to reach the end of its service life earlier than normal. Furthermore, the auto-cleaning function of the backup software uses ordinary cells, reducing the cells available for data cartridges. Fujitsu therefore recommends using the auto-cleaning function under control of the library (the factory default is "enabled").

1.2.5.2 Manual cleaning function

The drive is cleaned directly by operations on the operator panel.

For information on the method of performing the manual cleaning from the operator panel, see 4.8, "Cleaning the Drive Manually."

1.2.6 Functions for recovery

This library takes into account settings and operations for recovery corresponding to errors of the drive, library, and server.

1.2.6.1 Recovery method when a drive error occurs

If an error occurs in the drive during initialization or when a cartridge is loaded, "Error" is displayed in the "Drive Status" field on the Device Status window (home window) of the operator panel or remote panel. Recovery can be made possible by releasing the drive error by the reset operation on the operator panel and unloading the loaded cartridge into the original cell.

Important:

If the drive error cannot be released by the reset operation on the operator panel, contact the maintenance person.

1.2.6.2 Recovery method when a library error occurs

If the library detects a hardware error during initialization or when a cartridge is transported, "Error" is displayed in the "Library Status" field on the Device Status window (home window) of the operator panel or remote panel and also the Library Error icon is displayed in the icon area. Recovery can be made possible by releasing the library error by performing the reset operation on the operator panel.

Important:

If the library error cannot be released by the reset operation on the operator panel, contact the maintenance person.

1.2.6.3 Operation to be performed when the host goes down and a cartridge remaining in the drive should be unloaded

If a cartridge is loaded into the drive by backup software and the host goes down or an error occurs in the interface with the library, it becomes impossible to unload the cartridge by the backup software.

In that case, the cartridge that is loaded in the drive can be forced to be unloaded back into the original cell by using the manual eject function of the library.

The manual eject function can be performed by a manual eject operation on the operator panel.

Remarks:

For information on the method of operating the manual ejection from the operator panel, see 4.12, "Unloading a Cartridge Loaded from the Host."

⚠ CAUTION

Data loss: Do not perform this operation when the host accesses the drive normally. Otherwise, an error may occur in the drive path.

1.2.6.4 Auto-eject function

This function can unload all cartridges already loaded in the drive when the library is turned on (*1).

*1 It is necessary to "enable" the auto-eject function on the operator panel.

Important:

During automatic unloading by the library, an inconsistency in the cartridge management information may be detected, depending on the backup software.
If that type of backup software is used, perform the inventory operation of the backup software and update the management information of cartridge after "disabling" the auto-eject setting.

1.2.7 Remote panel function

This function can monitor the library and drive information via LAN from the general browser (such as Internet Explorer and Netscape) using the remote communication function of the library. It can also be used to set the operations and functions of the library and drive and to perform the cleaning function of the drive.

The remote panel is protected by the login password so that unauthorized access to it can be prevented. General passwords and administrator passwords are available.

- Login using a general password

  It is allowed to monitor the states of the library, drive, and tape and to reference the setup information.

- Login using an administrator password

  In addition to the functions logged in with a general password, operations such as the operation settings, functional settings, and cleaning can be performed.

Remarks:

1. To use the remote panel, it is necessary to make network settings in advance from the operator panel. For information on the methods of network settings and operating the remote panel, see 5, "Remote Panel Operation."
2. The recommended browser is Microsoft Internet Explorer 5.0 to 6.0 and Netscape Navigator 4.7 to 4.78.
3. The remote panel uses "Cookie" and "Java Script". Enable the settings of these functions of the browser to be used.

Important:

Use the remote panel in an environment in which sufficient network security measures are taken.

1.2.8 E-mail function

The E-mail function is available as a remote communication function of the library.

This function can send the error report E-mail containing error information is written to up to five mail addresses when a library or drive error occurs. The E-mail function can be set on the remote panel.

For information on the method of sending mail from the remote panel, see 5.5.5, " Setting the E-mail Function."

1.2.9 SNMP function

This library has the SNMP function linked to a system that manages hardware connected to a network.

The SNMP function uses the SNMP protocol to transmit device information obtained via MIB and error information obtained via TRAP from the SNMP agent incorporated into the library to the management software.

This enables centralized management of hardware at one location as is the case with other network devices.

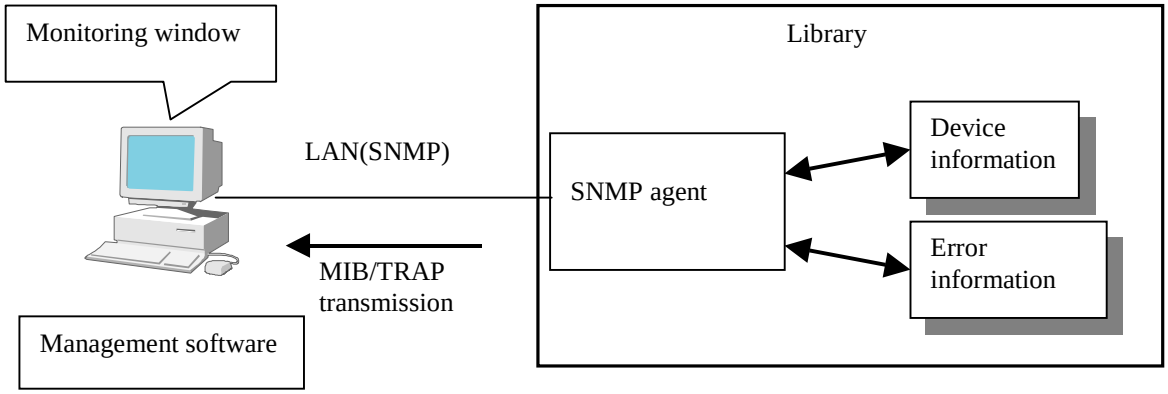


Figure 1.24 SNMP function

Settings related to the SNMP agent can be made from the remote panel. For information on the operation method, see 5.5.6, "Setting the SNMP agent."

Chapter 2 Introducing and Preparing the Library

2.1 Installing the Library

2.2 Preparing the Host Installation

2.3 Connecting the Library

2.4 Power-on and Power-off

2.5 Checking the Library and Drive Settings

2.6 Checking the Host Settings

2.1 Installing the Library

2.1.1 Conditions for library installation

In addition to the installation space of the device, space is required for opening and closing the front and rear doors.

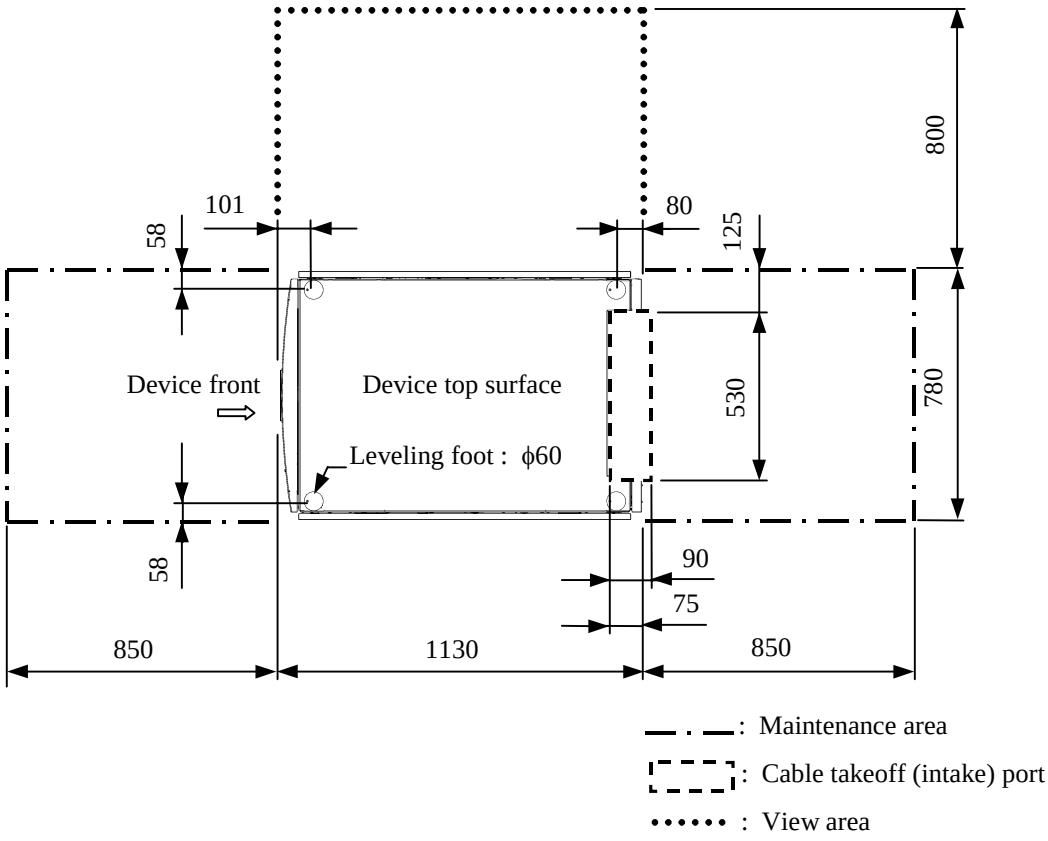


Figure 2.1 Space required for library installation

If the customer uses the LT160-20 or LT160-30 and plans to implement expansion in the future, separate space for installing the expansion locker will also be required.

Remarks:

Make a detailed inquiry about the installation space at the consultation liaison section.

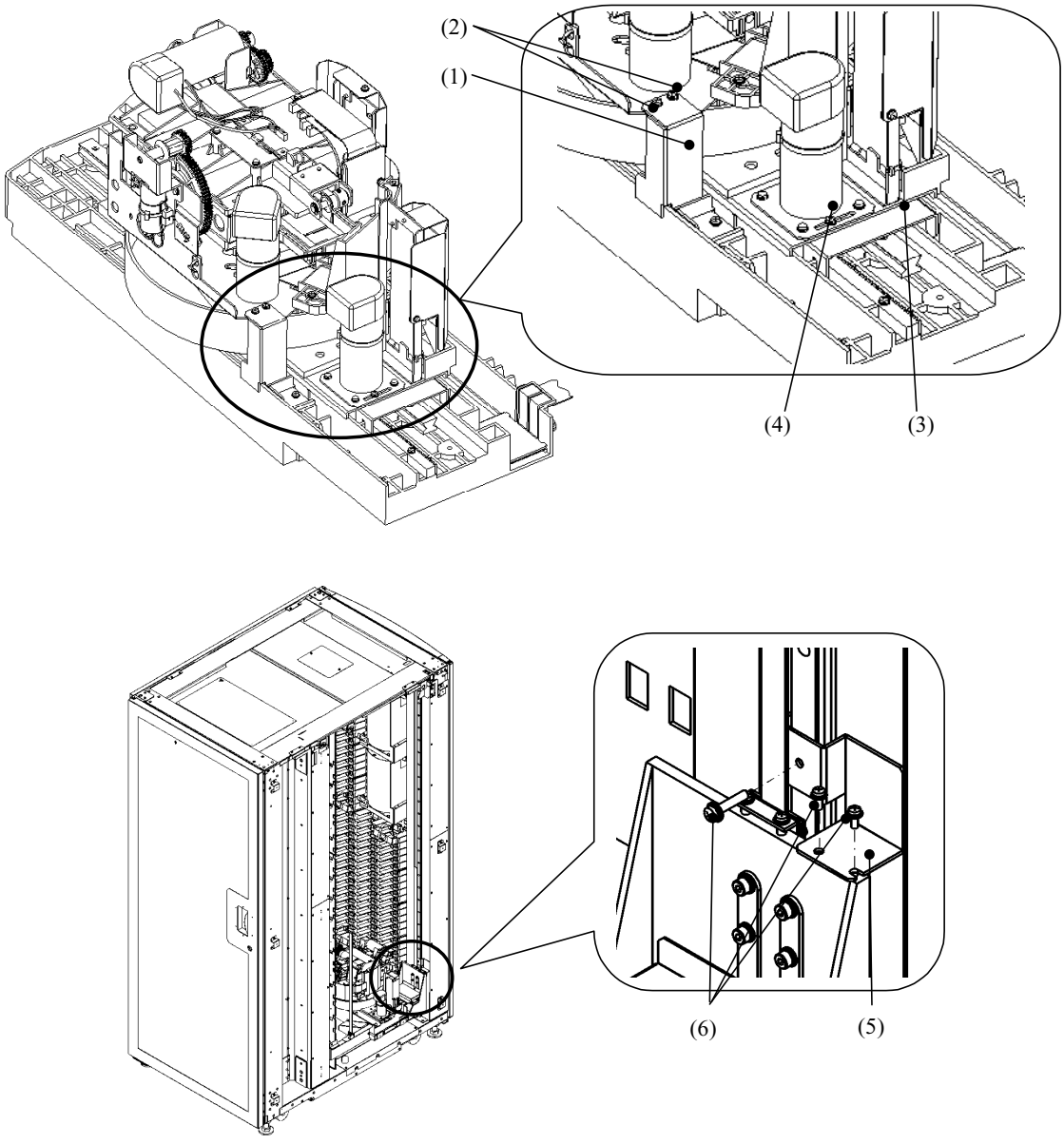


Figure 2.2 Removing transport metal brackets

Transport metal brackets

(1) Transport metal bracket 1

(2) Transport metal bracket 1 setscrews (two)

(3) Transport metal bracket 2

(4) Transport metal bracket 2 setscrew (one)

(5) Transport metal bracket 3

(6) Transport metal bracket 3 setscrews (three)

2.2 Preparing the Host Installation

This section explains how to prepare for host installation.

Refer to the "Setup Guide" provided with the library for information about the settings for the host, OS, driver, software, and hardware required to use the library.

Remarks:

A host, host bus adapter, FC switch, or other devices to be connected to the library must be ones that support the library.

1) Turn on the host and then install software or a driver or both software and driver that are compatible with the library.
2) Turn off all peripheral devices that are connected to the host computer using methods appropriate for each case.
3) Turn off the host. If the host computer is connected to a network, contact the system administrator before turning off the power.

Remarks:

1. Make sure that as many card extension slots as appropriate that can be used in the library model to be used are mounted in the host computer.
2. Make sure that the host bus adapter card is supported by the backup software application to be used.
3. To install the library on the same FC bus as other devices, check the target IDs (LOOP IDs) that can be used. If you suspect that the library has the same ID as another drive, you need to change the target ID from the operator panel.

2.3 Connecting the Library

The library is connected via the Fibre Channel interface to a host server. The host server is a server (such as Solaris and WindowsNT4.0/2000) on which software that controls the library (backup software) is installed. The backup software requests the library or drive to transport cartridges or requests access to data.

Remarks:

The library can have up to four Fibre Channel ports connected. If you wish to add another port, contact maintenance personnel.

The following explains how to connect the library via a Fibre Channel cable. Some options are available for the Fibre Channel cabling. For an overview, see Figure 2.3. To use a hub or switch, see the user's manual for the product to be used.

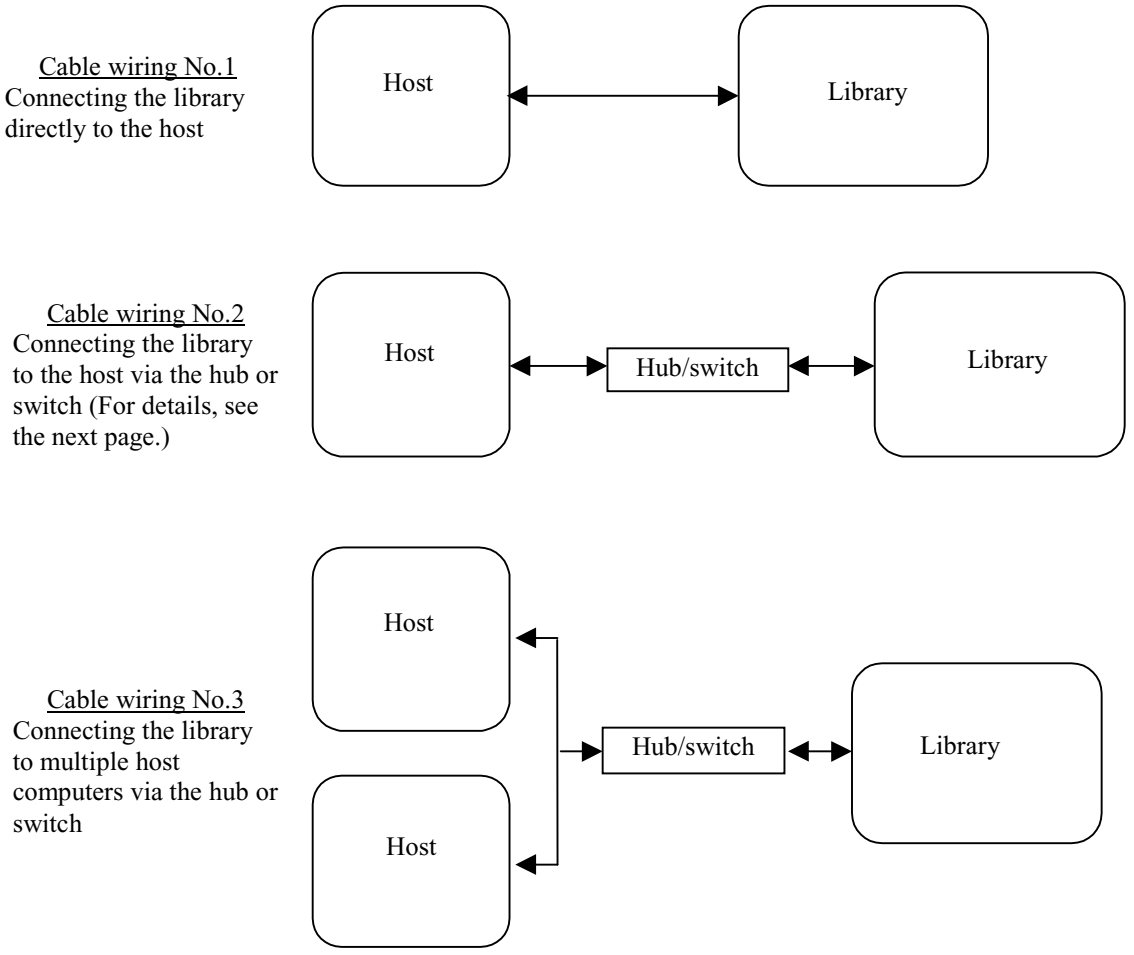


Figure 2.3 Fiber channel wiring methods

The following procedure explains the wiring of fiber channels among the host, hub/switch, and library.

Remarks:

To use a hub or switch, see the user's manual for the product to be used.

1) Make sure that the library and host are not active and the library is not connected to the host.
2) Make sure that the required software is installed.
3) Turn off the hub or FC switch. If the host is connected to a network, contact the system administrator before turning off the power.
4) Mount the host adapter on the host computer. To prevent electrostatic discharge (ESD), follow the correct procedure. When removing an internal component, be sure to wear the antistatic wrist strap and use the antistatic mat.
5) Connect the FC interface (or interfaces) of the library to the host, hub, or switch.
6) If there is an FC switch, turn it on.
7) Connect the power cord of the library to a grounded power outlet. Turn on the library by pressing the library's power switch. Turning on the power starts initialization. After some minutes, the home window opens, displaying the library's operator panel. In the home window, the status of the drive and of the library are displayed.

Remarks:

If a model has two power sources, do not connect the two power cords to one service outlet (power strip).

8) Set Fibre Channel from the operator panel. For the items that must be set, see 2.5, "Checking the Library and Drive Settings."
9) Turn on the host.

2.4 Power-on and Power-off

2.4.1 Power-on method

Press the power switch on the back panel to turn on the library or drive. The power-on method depends on whether RCI is used.

2.4.1.1 If RCI is not used

Turn on the power switch located on the back panel on the rear of the library.

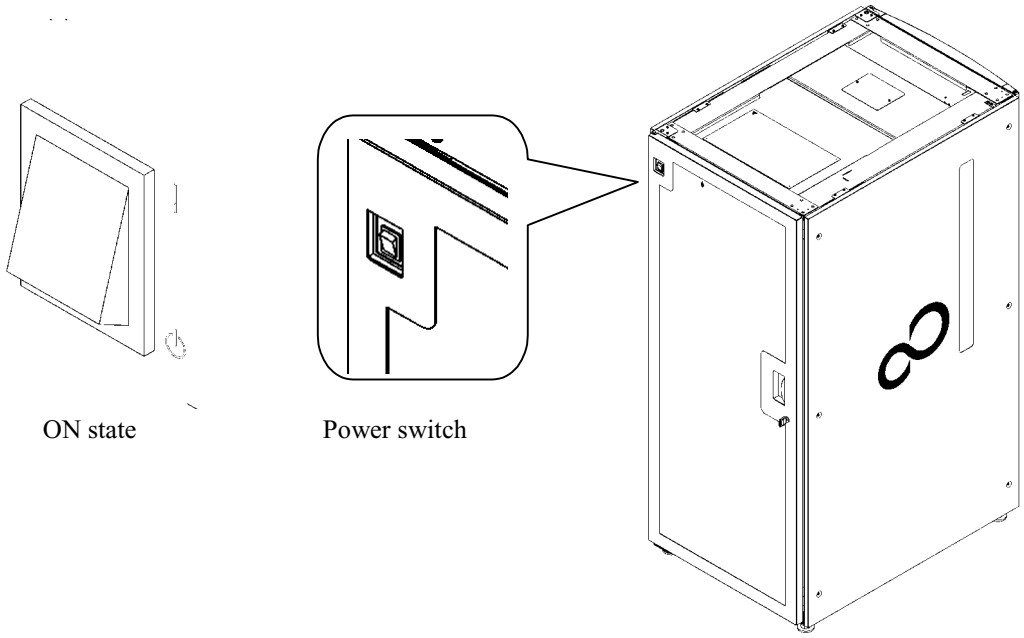


Figure 2.4 Power switch (power-on)

2.4.1.2 If RCI is used

If RCI is used, the host controls power-on. For more information, see the server manual.

Remarks:

If you turn on or off the power using RCI, the power switch of the library must be set to ON.

2.4.2 Power-off method

The power-off method for the library depends on whether RCI is used.

Remarks:

Before turning off the library, check that the operation is stopped and that no cartridge remains in the drives.

Emergency power-off method
If the power to the system must be turned off immediately in case of emergency, such as the occurrence of a library error, pull out the power supply plug.

2.4.2.1 If RCI is not used

Turn off the power switch located on the back panel on the rear of the library.

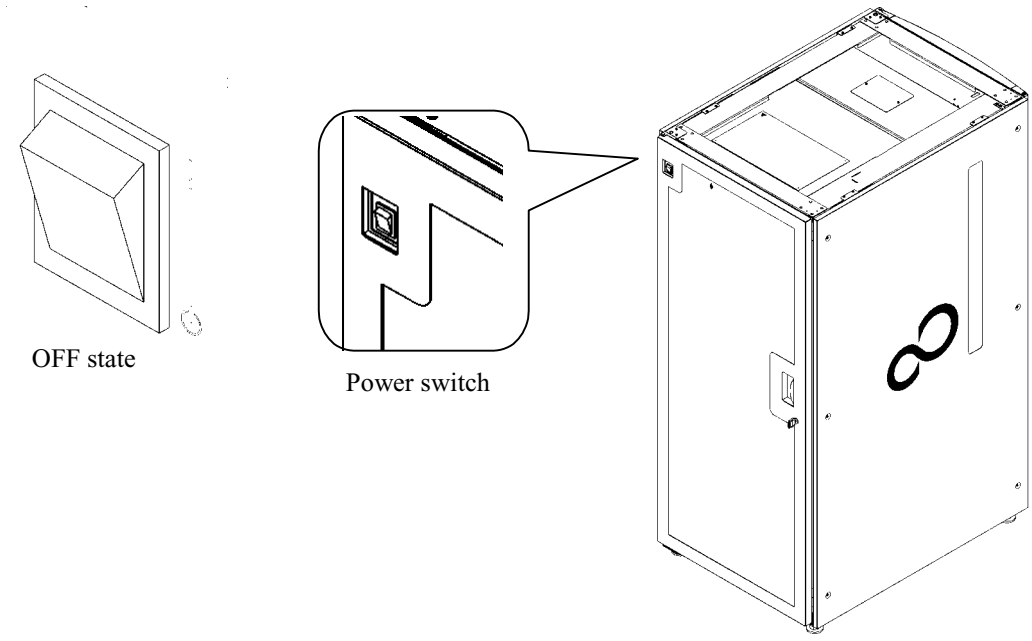


Figure 2.5 Power switch (power-off)

2.4.2.2 If RCI is used

If RCI is used, the host controls power-on. For more information, see the server manual.

Remarks:

If you turn on or off the power using RCI, the power switch of the library must be set to ON.

2.5 Checking the Library and Drive Settings

From the operator panel or remote panel, check the settings of the drive and library being used.

2.5.1 Checking the drive settings

A Fibre Channel Loop ID must be set for each drive. The factory default is "Soft Address."

For information on the setting method, see 4.4, "Setting the Target ID of the Drive."

2.5.2 Checking the library settings

2.5.2.1 Checking the target ID setting

A Fibre Channel Loop ID must be set for each adapter port. The factory default is "Fabric."

For information on the setting method, see 4.5.1.1, "Setting the library target (Loop) ID for each adapter."

2.5.2.2 Checking the host WWPN setting

The host WWPN for which access is permitted must be set for each adapter port. Since the factory default specifies no value, access from any host is permitted.

For information on the setting method, see 4.5.1.2, "Setting the host WWPN permitted for each adapter (If needed)."

2.5.2.3 Checking the auto-cleaning function setting

The auto-cleaning function detects a cleaning request from a drive and automatically cleans the drive using a cleaning cartridge. Auto-cleaning is enabled by the factory default.

For information on the setting method, see 4.5.2, "Setting library information."

2.5.2.4 Checking the auto-inventory function setting

The auto-inventory function collects cartridge information in all the cells during the initialization operation after power-on. The factory default is that inventory is taken after power-on.

For information on the setting method, see 4.5.2, "Setting library information."

2.5.2.5 Checking the auto-eject function setting

The auto-eject function forcibly returns a cartridge in the drive to the original cell during initialization after power-on. The factory default is that a cartridge is not automatically returned to the original cell.

For information on the setting method, see 4.5.2, "Setting library information."

2.5.2.6 Checking the fast load function setting

The fast load function enables the next mount operation during the current mount operation (without waiting for the drive to become ready) to speed up robot performance. The factory default is "disabled."

For information on the setting method, see 4.5.2, "Setting library information."

2.5.2.7 Checking the time and date setting

When you initially set up the library, adjust the clock in the library from the operator panel or remote panel.

For information on the procedure, see 4.5.4, "Setting the clock"(setting made from the operator panel) or 5.5.4, "Setting the clock" (setting from the remote panel).

The library also supports automatic adjustment using NTP (only the client function). For information on the setting method, see 4.5.3, "Setting information about the network."

2.5.2.8 Checking the remote panel settings

You can manage and monitor your own library from anywhere on the network from an easy-to-use Web page.

To use the remote panel, you must make the network settings from the operator panel. For information on the setting method, see 4.5.3, "Setting information about the network."

Remarks:

The library must be restarted for the changes to the network settings to take effect.

2.6 Checking the Host Settings

(1) Installing the backup software and driver (if necessary)

Install the host driver, backup software, and host bus adapter card, and then make their settings (if they have not been set).

Remarks:

For details on the setting and check methods of the host driver and backup software, see *"ETERNUS LT160 Magnetic Tape Library Device Setup Guide"*

(2) Checking the installation

To check the installation, turn on the host and then search for the library and drive.

- For Windows NT, select [Settings], [Control Panel], and finally [SCSI adapter].
- For Sun Solaris, check the installation by seeing the message on the FC host bus adapter driver that is output to the OS startup log (such as /var/adm/messages) specified in the /etc/syslog.conf file or using the utility commands provided with the FC host bus adapter.

Perform backup on a trial basis to make sure that all the components are correctly set up.

Remarks:

For more information on setting or checking the driver of the host bus adapter or the backup software, see the "ETERNUS LT160 Tape Library Setup Guide" provided with the library or the host bus adapter manual.

Chapter 3 Library Operation

3.1 Inserting and Ejecting a Cartridge (Data Cartridge)

3.2 Cleaning the Drive

3.3 Power to the unit

3.4 Turning on the server

3.1 Inserting and Ejecting a Cartridge (Data Cartridge)

This section explains how to insert and eject a data cartridge.

Remarks:

For information on inserting and ejecting a cleaning cartridge, see Section 4.9.

To insert a cartridge into a cell inside the library, either manually insert it after opening the front door or insert it from the CAS using a backup software operation. The first method allows you to insert a large number of cartridges at one time, but opening the front door places the library offline. Therefore, if you want to insert a cartridge during operation, you can only do so from the CAS.

To eject a cartridge from the library, either manually eject it after opening the front door or eject it from the CAS using a backup software operation. As with insertion of a cartridge, the first method allows you to eject a large number of cartridges at one time, but opening the front door places the library offline. Therefore, if you want to eject a cartridge during operation, you can only do so from the CAS (Using the operator panel, you can eject only a cleaning cartridge in the cleaning cell).

3.1.1 Inserting/Ejecting a cartridge by opening the front door

The following explains how to insert and eject a cartridge by opening the front door:

⚠ CAUTION

Damage to the library: If work is done while the front door is open, be careful not to touch the robot, cables, and printed circuits.

1) If the front door is opened, the library goes offline. Stop the operation of backup software before opening the front door.

⚠ CAUTION

Data loss: If the front door is opened during operation, the system performs an emergency stop. Before opening the front door, stop the software backup.

2) Open the front door. At this point, make sure that a notification is displayed in the popup window in the main area of the operator panel and the Front Door Opened icon is lit in the icon area.

3) Insert a cartridge into the cell or eject it from the cell. When inserting a cartridge, insert it as far as it will go with the cartridge having the correct orientation, as shown in Figure 3.1. If the insertion orientation is correct, the bar code label is facing the front (orientation in which the robot can read) and the reel surface of the cartridge is pointing downward.

   The hand section can be moved by hand.

When manually inserting a cartridge into the cell, insert it such that it has the correct orientation by checking the following points:

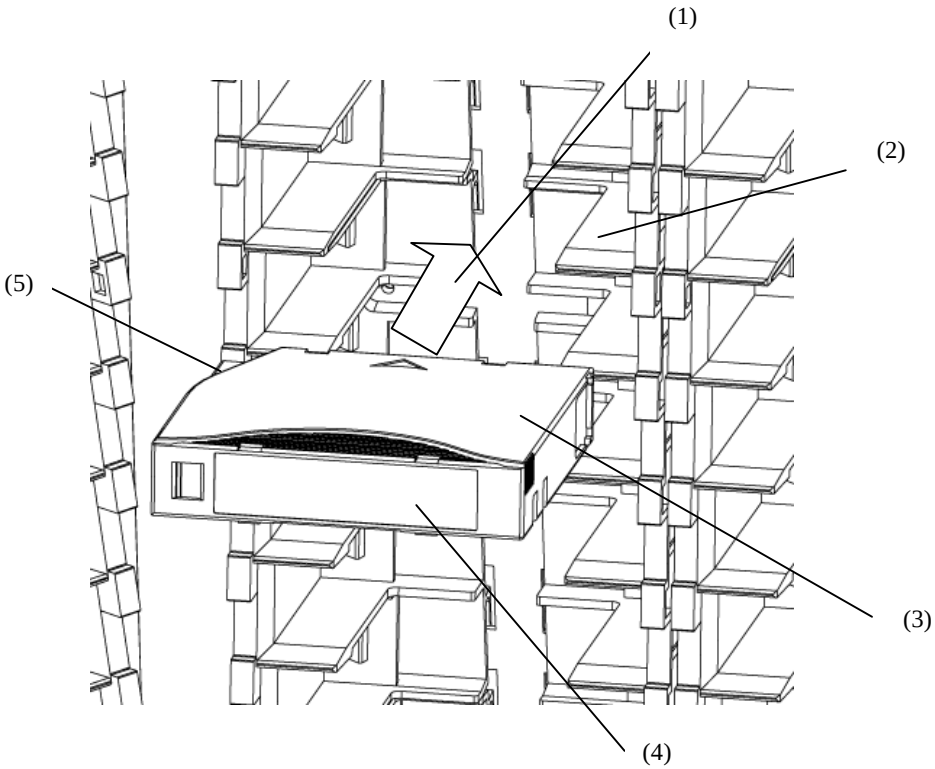
- The bar code label faces the front (orientation in which the robot can read).
- The reel surface of the cartridge faces downward.

Remarks:

Although a cartridge on which no bar code label is affixed can be used for operation, it is recommended that a cartridge on which a bar code label is affixed be used so that management information of individual cartridges can be differentiated.

⚠ CAUTION

Damage to the library:
Do not insert a cartridge into the following cells:
- Cleaning cell (A cleaning cartridge can be inserted.)
- Replacement cell
- Reserve cell
- Diagnostic cell



(1) Cartridge insertion direction

(2) Cell

(3) Cartridge

(4) Label surface

(5) Groove for preventing improper insertion

Figure 3.1 Cartridge insertion direction

4) If insertion/ejection is finished, close the front door.

5) Close the front door. The library automatically takes inventory, the management information of cartridges managed by the library is updated, and the library goes back online.

   Confirm at this point that the Front Door Opened icon, previously lit in the icon area of the operator panel, is now off.

6) Perform the inventory operation of the backup software to update the cartridge management information for cartridges held by the backup software.

⚠ CAUTION

Damage to the library:
Never insert a cartridge with the cartridge having the wrong orientation and never insert an out-of-spec cartridge. Otherwise, the robot may be damaged. The robot may not operate normally if a cartridge is inserted into any cell other than the specified one. The insertion location of cartridges differs by model. Refer to Appendix A, "Model Configuration" before inserting a cartridge into the specified cell.

Important:

If the robot obstructs the work, perform the work by manually keeping the robot out of the way. The robot unit can be moved vertically by hand. The hand mechanism can be moved in the left/right direction by hand and rotated horizontally by hand.

Note the following points when moving the robot by hand:

- If the robot unit is moved while the picker mechanism or cartridge is extended from the hand mechanism (Figure 3.2), the robot unit, cartridges, or storage cell may be damaged. Be sure to move the robot after pushing the picker mechanism into the hand mechanism by hand (Figure 3.3). If cartridges are held, push the picker mechanism after ejecting the cartridges.
- If the robot unit is moved vertically while the hand mechanism is on the right side (Figure 3.4), the hand mechanism may hit the cartridges or storage cell. Move the robot unit while the hand mechanism is on the left side (Figure 3.5).
- A stopper that specifies the range in which the robot can move is mounted on the robot unit. When moving the robot manually, make sure that the robot does not hit the stopper hard. Otherwise, the robot could fail.
- The robot has some locations where lubricating oil is applied for smooth operation of the mechanisms (Figure 3.6). When moving the robot manually, do not touch such locations.

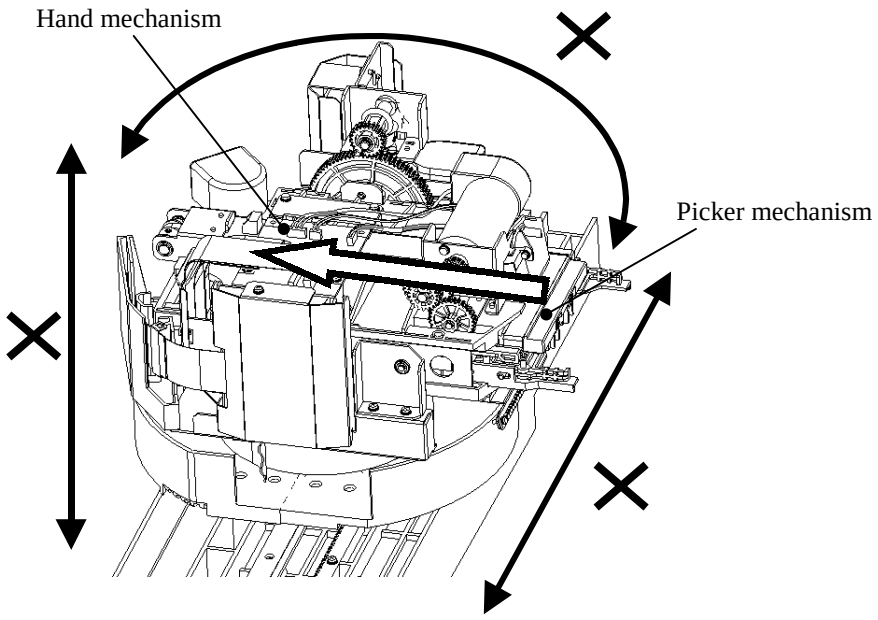


Figure 3.2 Picker mechanism protruding from the hand mechanism

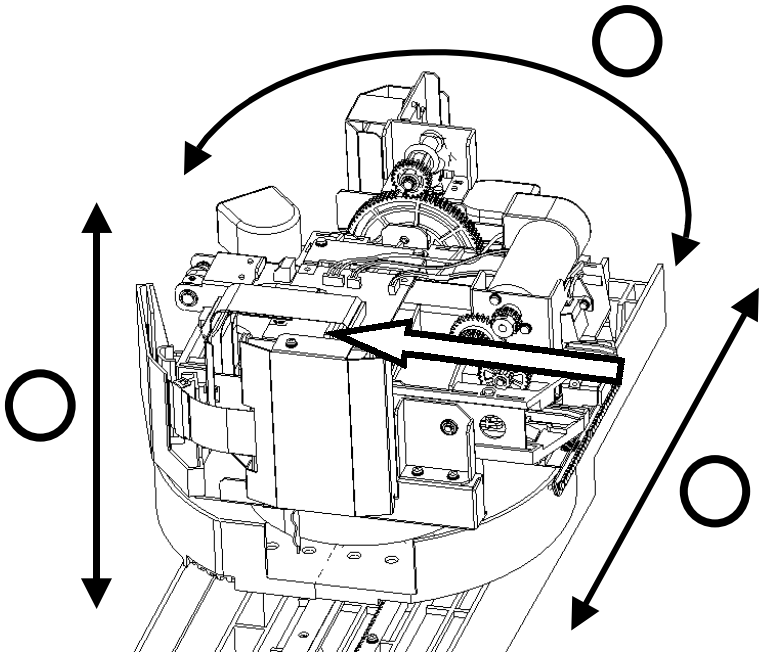


Figure 3.3 Picker mechanism that has been completely inserted into the hand mechanism

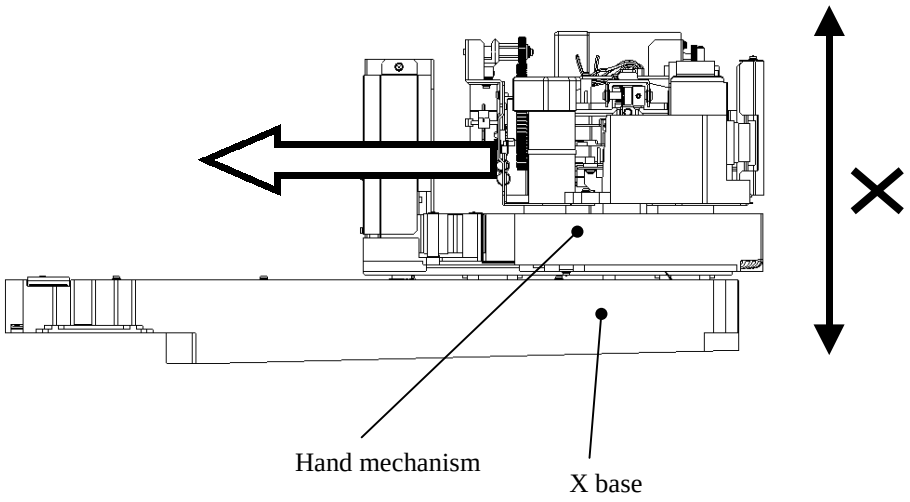


Figure 3.4 Hand mechanism placed on the right edge

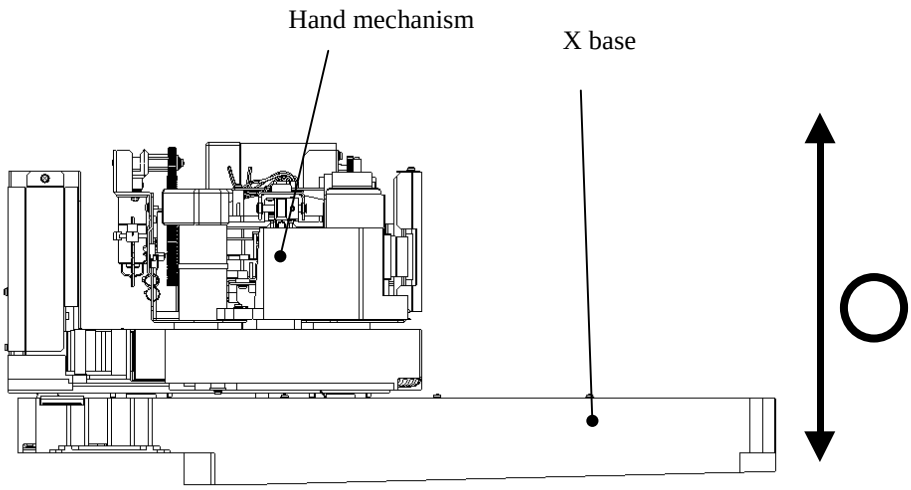
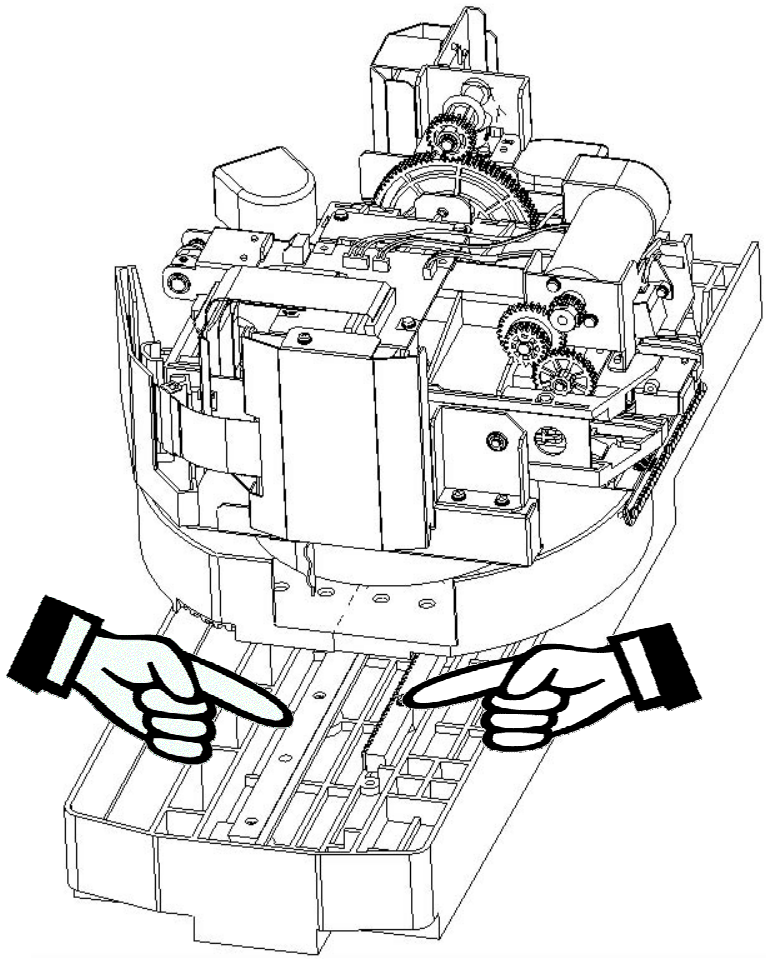


Figure 3.5 Hand mechanism placed on the left edge



: Grease (oil) application section

Figure 3.6 Parts requiring grease in the robot

3.1.2 Inserting/Ejecting cartridges from CAS

The following explains how to insert a cartridge from CAS using the backup software.

3.1.2.1 Inserting cartridges from CAS

1) Open the magazine door. At this point, make sure that the CAS Opened icon is lit in the icon area of the operator panel.
2) Put into the magazine the cartridge you want to insert (see 1.1.5.1, "Inserting cartridges into the magazine").
3) Close the magazine door. At this point, make sure that the CAS Opened icon is off.
4) Perform the operation for insertion into the cell using the backup software.

Remarks:

After the CAS Open icon goes out, the library automatically makes an inventory of magazines. Perform the insertion operation from the backup software after the inventory operation is completed.

3.1.2.2 Ejecting into CAS

1) If there is no magazine in CAS, first put a magazine in CAS.
2) Perform the operation for ejection into CAS from the backup software.
3) Open the magazine door. At this point, make sure that the CAS Opened icon is lit in the icon area of the operator panel.

Remarks:

For information about performing the CAS Open operation (to be performed from the operator panel), see 4.6, "Opening the Magazine Door."

4) Pull out the magazine and remove the ejected cartridge (See 1.1.5.2 "Ejecting cartridges from the magazine").

3.2 Cleaning the Drive

This section explains how to clean the drive.

The auto cleaning function and manual cleaning function are available as cleaning functions. Both the auto cleaning function and manual cleaning function use the cleaning cartridge in the cleaning cell.

Remarks:

1. If no cleaning cartridge is inserted into the cleaning cell, neither the auto cleaning function nor manual cleaning function can be used. Insert a cleaning cartridge from CAS into the cleaning cell via operation from the operator panel.

   For information about the operation using the operator panel, see 4.9.1, "Inserting a cleaning cartridge."

2. The maximum number of times that a cleaning cartridge can be used is determined by each drive maker.

   If the maximum number of times of a cleaning cartridge can be used in the cleaning cell is reached, the Exchange Clean Tape icon goes on in the icon area of the operator panel. If this icon is on, eject the cleaning cartridge as it should not be used any more, and replace it with a new one.

   The cleaning cartridge can be ejected into CAS by performing an operation from the operator panel.

   For information about the operation from the operator panel, see 4.9.2, "Ejecting a cleaning cartridge."

3.3 Power to the unit

Do not attempt to execute any operation involving software backup while the power to the LT160 is off, or while the power is being turned on to initialize the LT160. Otherwise, a malfunction may occur.

If the power to the LT160 is turned off during backup, the integrity of data being written cannot be guaranteed. In addition, the cartridge to which the data is being written might be disabled. In such a case, contact the support department in charge of the backup software, take the recommended corrective action, and reexecute the backup.

3.4 Turning on the server

If the server is turned on while the LT160 is being initialized, the server might not correctly identify the LT160. Instead, turn on the server power after initialization of the LT160 is completed.

Chapter 4 Operator Panel Operation

4.1 Overview of the Operator Panel
4.2 Referencing the Status of the Library/Drive
4.3 Referencing Library Information
4.4 Setting the Target ID of the Drive
4.5 Setting Library Information
4.6 Opening the Magazine Door
4.7 Loading/Unloading a Cartridge
4.8 Cleaning the Drive Manually
4.9 Inserting/Ejecting a Cleaning Cartridge
4.10 Releasing a Hardware Error of the Library/Drive
4.11 Releasing the Front Door Open Status
4.12 Unloading a Cartridge Loaded from the Host
4.13 Making an Inventory

4.1 Overview of the Operator Panel

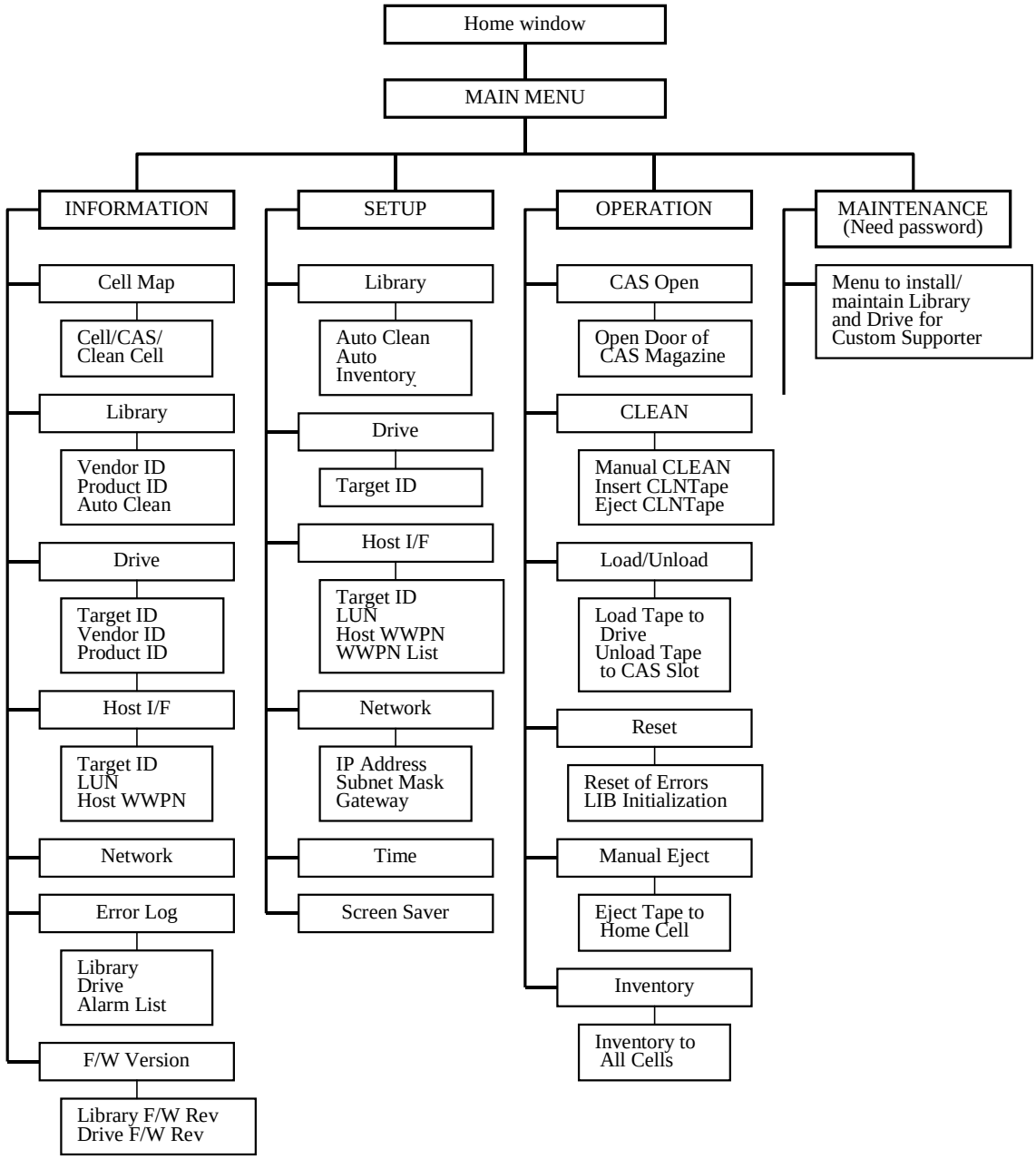
4.1.1 Touch-panel operation

The operator panel is positioned on the front of the library.

It is possible to perform operations such as referencing/setting the library and drive status and opening the magazine door of CAS from the operator panel.

By selecting the buttons on the operator panel, operations such as window transition, function selection, and setup value input can be performed.

The menu structure of the operator panel is as shown below:


Home window
MAIN MENU
INFORMATION
Cell Map
Cell/CAS/
Clean Cell
Library
Vendor ID
Product ID
Auto Clean
Drive
Target ID
Vendor ID
Product ID
Host I/F
Target ID
LUN
Host WWPN
Network
Error Log
Library
Drive
Alarm List
F/W Version
Library F/W Rev
Drive F/W Rev
SETUP
Library
Auto Clean
Auto
Inventory
Drive
Target ID
Host I/F
Target ID
LUN
Host WWPN
WWPN List
Network
IP Address
Subnet Mask
Gateway
Time
Screen Saver
OPERATION
CAS Open
Open Door of
CAS Magazine
CLEAN
Manual CLEAN
Insert CLNTape
Eject CLNTape
Load/Unload
Load Tape to
Drive
Unload Tape
to CAS Slot
Reset
Reset of Errors
LIB Initialization
Manual Eject
Eject Tape to
Home Cell
Inventory
Inventory to
All Cells
MAINTENANCE
(Need password)
Menu to install/
maintain Library
and Drive for
Custom Supporter

4.1.2 Window type

The windows on the operator panel can be roughly divided into the initialization window, home window, and menu window.

4.1.2.1 Initialization window

Initialization is started when the library is turned on.

In the initialization window, the processing contents of the library are displayed using characters.

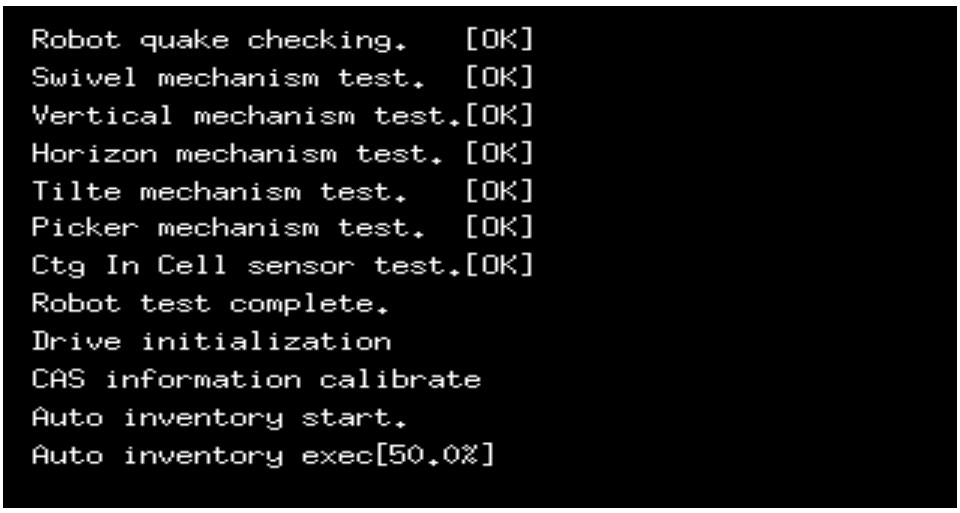


Figure 4.1 Initialization window

4.1.2.2 Home window

If the initialization is completed, the operator panel switches to the home window.

In the home window, as Device Status, the library/drive status is displayed in the main area and the library status is displayed in the icon area in real time.

* Selecting an icon that indicates the library status displays its contents.

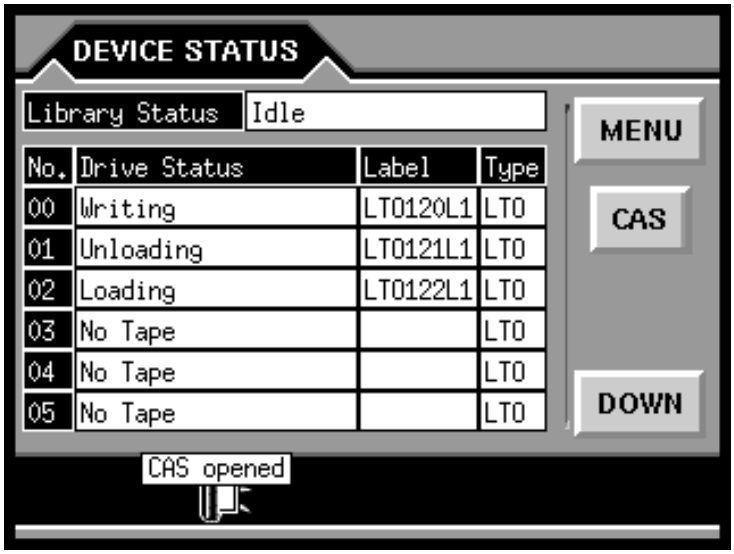


Figure 4.2 Home window

4.1.2.3 Menu window

Selecting the [MENU] button in the home window switches the panel to the menu window.

From the menu window, it is possible to reference and set information and perform library operations.

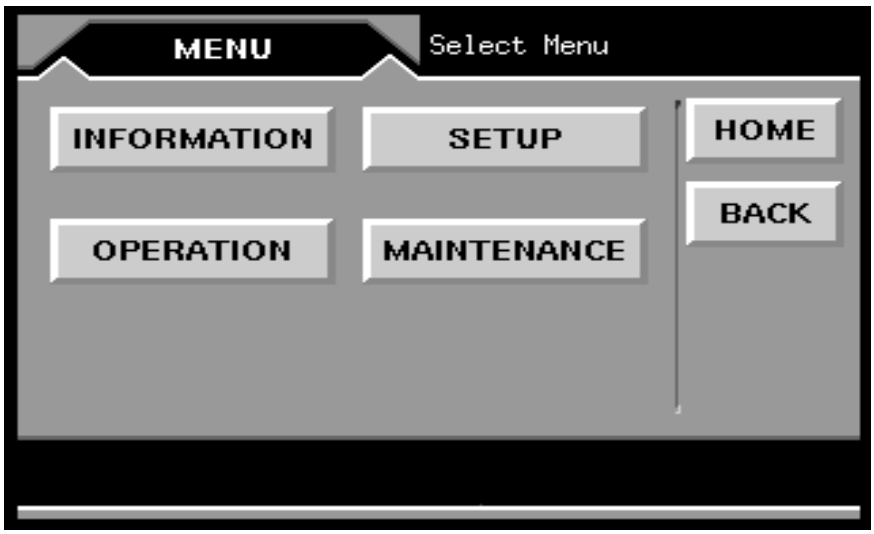


Figure 4.3 Menu window

[INFORMATION] button	Library/drive information reference The cartridge label name of general cells and CAS magazine cells, library mode setup information, and error log can be referenced.
[SETUP] button	Library/drive information settings Settings for the Target ID, networks, and library modes can be made.
[OPERATION] button	Library operation Operations such as loading to the drive, unloading from the drive, and manual cleaning can be performed.
[MAINTENANCE] button	Menu exclusively used for maintenance Only maintenance persons are allowed to use this menu.

4.1.3 Window configuration

The home window and menu window of the operator panel are divided into the five areas shown in Figure 4.4.

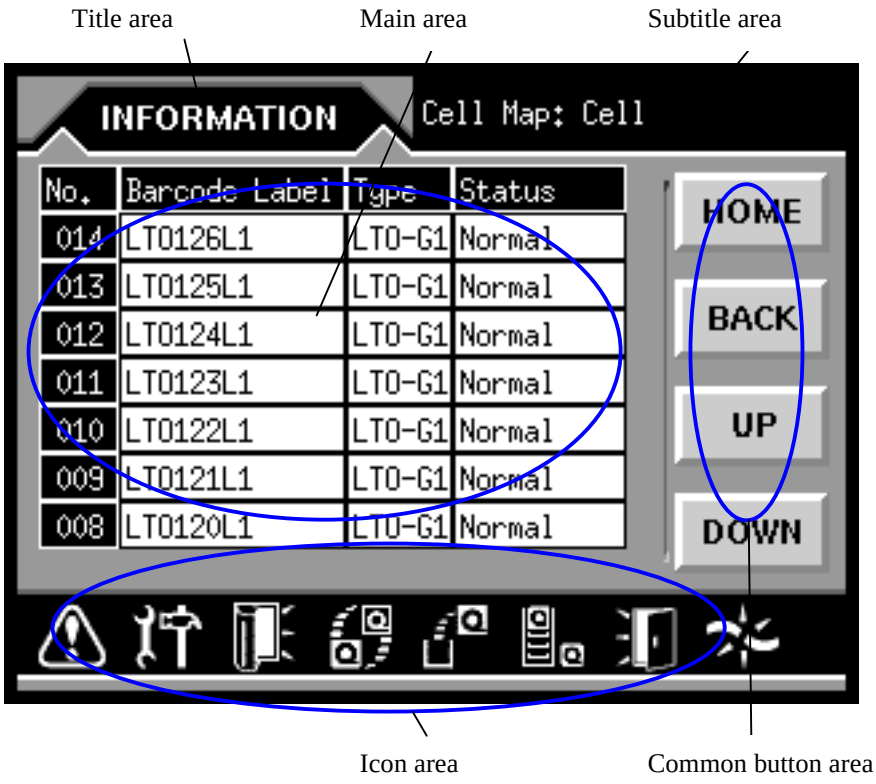


Figure 4.4 Configuration of home window and menu window

(1) Title area

The title of the window is displayed.

- Device Status: Indicates the home window.
- MENU: Indicates the menu window after the MENU button is selected.
- INFORMATION: Indicates the INFORMATION menu.
- SETUP: Indicates the SETUP menu.
- OPERATION: Indicates the OPERATION menu.

(2) Subtitle area

The subtitle of the window is displayed.

The button names of the function selected from the menu window are displayed.

Also, supplementary information such as conditions for selection and effective values in the setup range is displayed.

(3) Main area

Used for the display (home window) of the library/drive status and the button operation area when the [MENU] button is selected.

When used as the home window, the status of the library and drive is displayed.
When used as the menu window, buttons for performing operations are displayed.

(4) Icon area

The library status is displayed using characters in real time.

* When an icon displayed in the home window status is selected, the contents of the icon are displayed.

The following table lists the icons that indicate the library status.

	Library Error A hardware error occurred in the library.
	Library Alarm The alarm information for the library is retained. This icon goes off if the alarm status is released.
	CAS Opened The CAS door is open.
	Exchange Clean Tape Insert from the CAS a new cleaning cartridge that is usable.
	No Clean Tape Exist Insert a cleaning cartridge from the CAS.
	Exist In Reserve Cell Open the front door and remove the cartridge.
	Front Door Opened The front door is open.
	Library Offline The library is offline.

(5) Common button area

Common button operation area to the windows displayed in the main area

- [MENU] button

  Switches the main area from the home window to the menu window.

- [HOME] button

  Returns to the home window from the menu window.

- [UP] button

  Scrolls back to the previous page in the home and menu windows.

- [DOWN] button

  Scrolls to the next page in the home and menu windows.

- [BACK] button

  Returns to the previous window in the menu window.

- [CAS] button

  Shortcut to the menu to open the magazine door of CAS

4.2 Referencing the Status of the Library/Drive

In the main area of the home window, the status of the library and drive is displayed in real time. For information about the meaning of each status name, see Tables 4.1 and 4.2.

Table 4.1 Library status

Initializing	Indicates that the library is being initialized.
Idle	Indicates that the library has stopped normally.
Moving	Indicates that the robot is in operation.
Checking Inventory	Indicates that the library is taking inventory of the CAS or cells.
Front Door Opened	Indicates that the front door is open.
Offline	Indicates that the library is offline.
Error	Indicates that an error occurred in the library. The error code is also displayed.
Firmware Updating	Indicates that the firmware is being updated.

Table 4.2 Drive/Cartridge

Initializing	Indicates that initialization is under way after drive power-on.
No Tape	Indicates that no cartridge is inserted.
Loading	Indicates that the drive is loading.
Ready	Indicates that the drive is read/write ready after completing loading.
Write Protected	Indicates that the loaded cartridge is write protected.
Rewinding	Indicates that the tape is being rewound.
Reading	Indicates that the tape is being read.
Writing	Indicates that the tape is being written to.
Erasing	Indicates that the tape is being erased.
Locating	Indicates that the tape is being located.
Unloading	Indicates that the drive is unloading.
Unloaded	Indicates that the unloading is completed.
Cleaning	Indicates that cleaning is under way after loading a cleaning cartridge.
Required Clean	Indicates that the drive requires cleaning.
Need Clean	Indicates that the drive requires cleaning. *1) In this state, only a cleaning cartridge can be loaded.
Error	Indicates that an error occurred in the drive. Its error code is also displayed.
Fan Alarm	Indicates that the cooling fan in the drive unit has failed.
Media Error	Indicates that an error occurred in the loaded cartridge.
Updating	Indicates that the firmware of the drive is being updated.
No DRV or POFF	Indicates that no drive is installed or the power is off.

Table 4.3 Drive/cartridge status (added to the end of indications of library or drive statuses listed in Table 4.2)

XXX/N.C	Indicates that the FC cable is not connected.
XXX/OFL	Indicates that the drive is offline.

4.3 Referencing Library Information

4.3.1 Referencing cell cartridge information

It is possible to reference cartridge information such as the cell address, label name, and cartridge type of general cells, magazine cells, cleaning cells, reserve cells, and diagnostics cells.

First, select the [Cell Map] button from the INFORMATION menu.

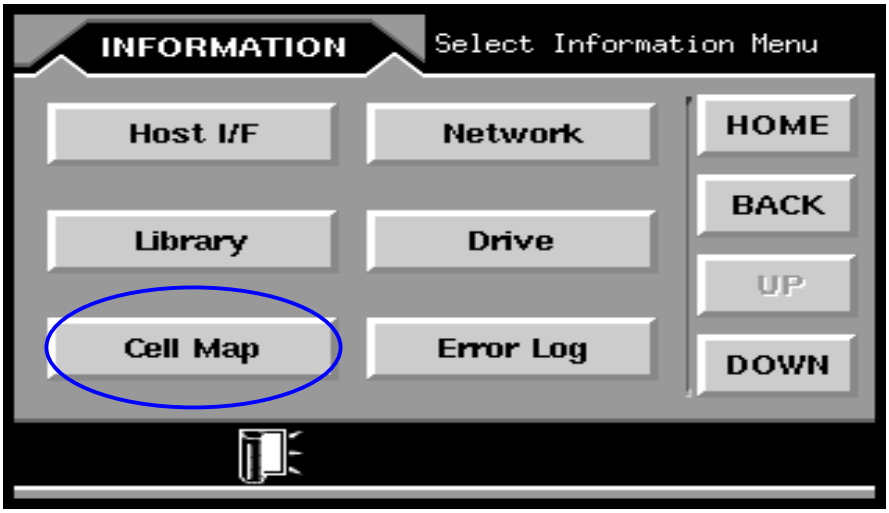


Figure 4.5 Selecting the [Cell Map] button

4.3.1.1 Referencing general cell cartridge information

1) Select the [Cell] button from Cell Map.

```
INFORMATION menu
  -Cell Map
   +Cell
```

2) Select the column number to be referenced.

*1) The column number that can be selected depends on the model type.

```
INFORMATION menu
  -Cell Map
   -Cell
    +CLM#00
    +CLM#01
```

3) The bar code label name and cartridge type (such as LTO-G1) of the general cell are displayed.

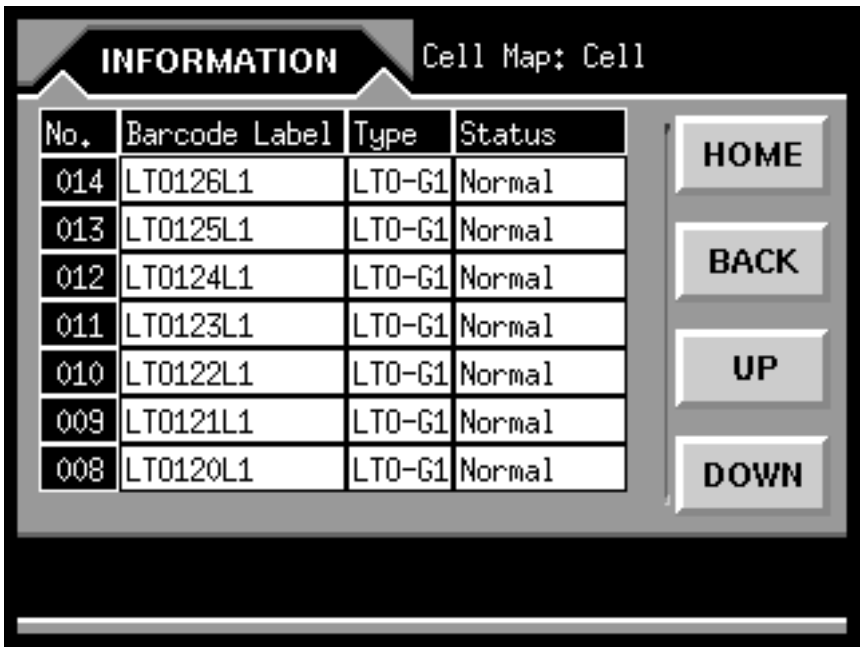


Figure 4.6 Cartridge information reference window for general cells

4.3.1.2 Referencing magazine cell cartridge information

1) Select the [CAS] button from Cell Map.

```
INFORMATION menu
  -Cell Map
   +CAS
```

2) Select the magazine number to be referenced.

```
INFORMATION menu
  -Cell Map
   -CAS
      +MGZ#0
      +MGZ#1
```

3) The bar code label name and cartridge type (such as LTO-G1) of the magazine cell are displayed.

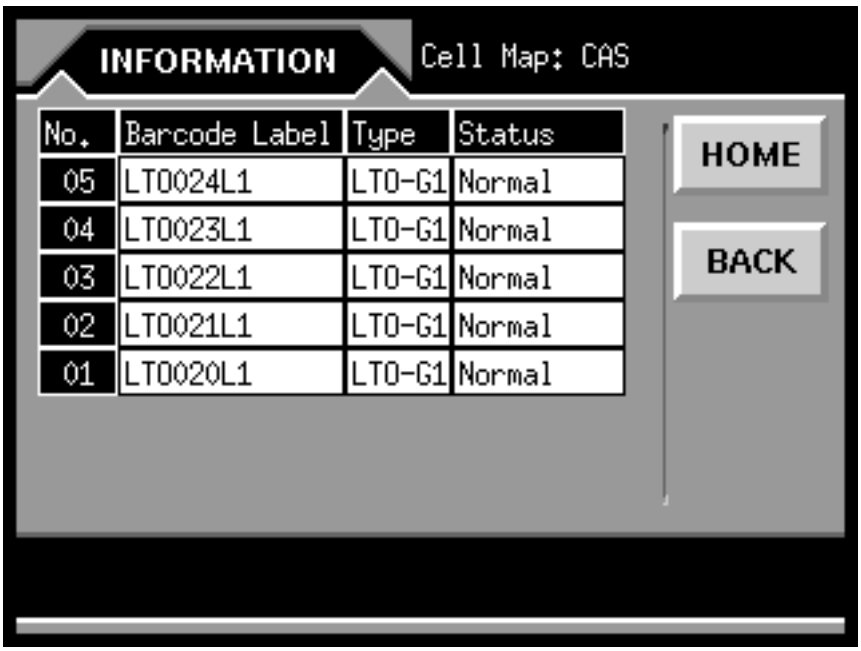


Figure 4.7 Reference window for magazine cell cartridge information

4.3.1.3 Referencing cleaning cell cartridge information

1) Select the [Clean Cell] button from Cell Map.

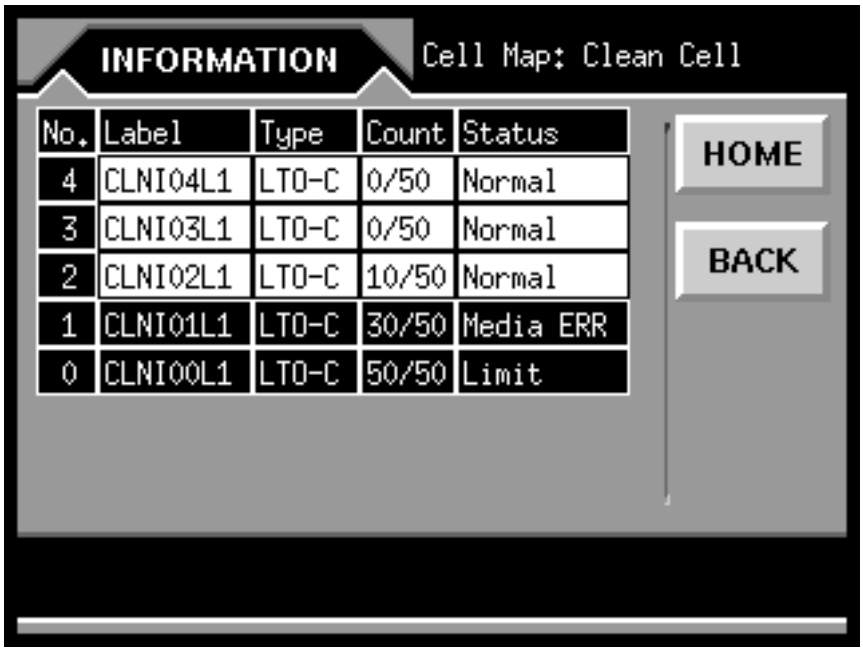
```
INFORMATION menu
  -Cell Map
   +Clean Cell
```

2) The following cleaning cell cartridge information is displayed:

- Bar code label name
- Cartridge type (such as LTO-C)
- Count (count used/available count)
- Status (Normal/Limit/Error)

Remarks:

Only cleaning cartridges whose status is Normal can be used for cleaning with the auto cleaning and manual cleaning functions. Eject cleaning cartridges whose status is Limit or Error.



- Normal: Indicates that the cartridge can be used.
- Limit: Indicates that the maximum number of times that the cartridge can be used has been reached.
- Media ERR: Indicates that the cartridge cannot be used due to a cartridge error.

Figure 4.8 Reference window for cleaning cell cartridge information

4.3.1.4 Referencing reserve cell cartridge information

1) Select the [Reserve Cell] button from Cell Map.

```
INFORMATION menu
  -Cell Map
   +Reserve Cell
```

2) The following reserve cell cartridge information is displayed:
   - Bar code label name
   - Cartridge type (such as LTO-G1)

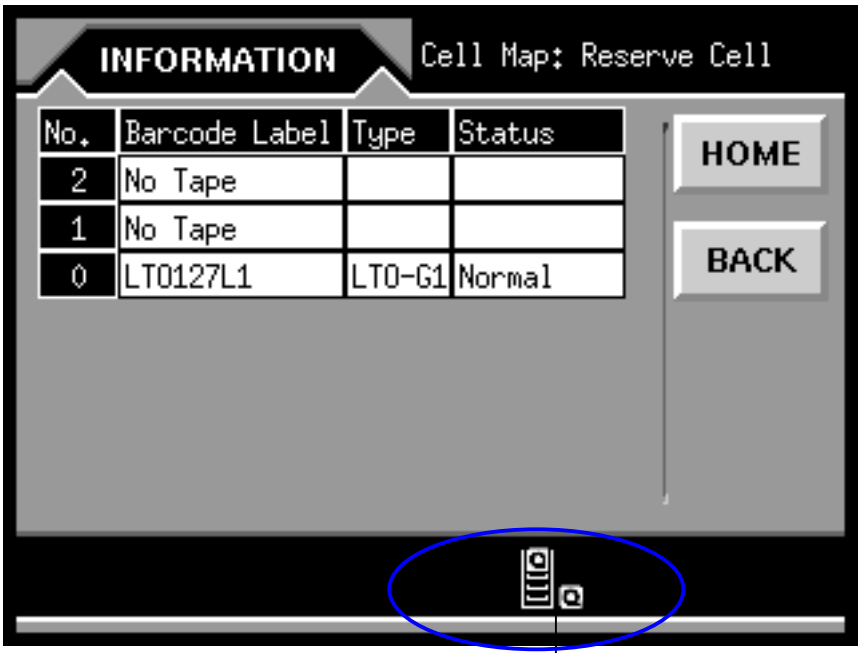


Figure 4.9 Reference window for reserve cell cartridge information

4.3.1.5 Referencing diagnostics cell cartridge information

1) Select the [Diag Cell] button from Cell Map.

```
INFORMATION menu
  -Cell Map
   +Diag Cell
```

2) The following diagnostics cell cartridge information is displayed:
   - Label name
   - Cartridge type (such as LTO-G1)

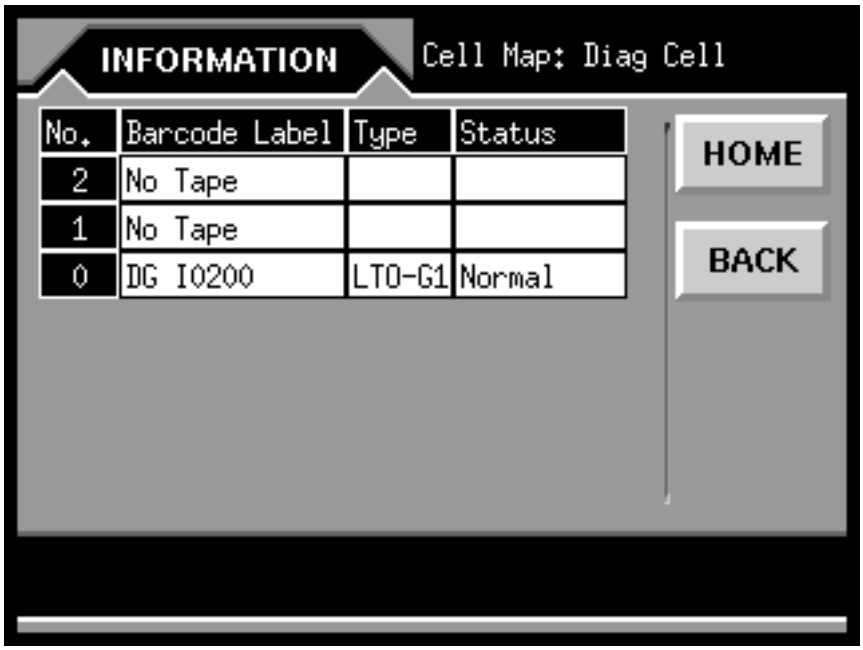


Figure 4.10 Cartridge information reference window for diagnostic cell

4.3.2 Referencing information about the host interface

You can reference the Target ID, LUN, and WWN of the library adapter and a host WWN for which access is permitted.

1) Select the [Host I/F] button from the INFORMATION menu.

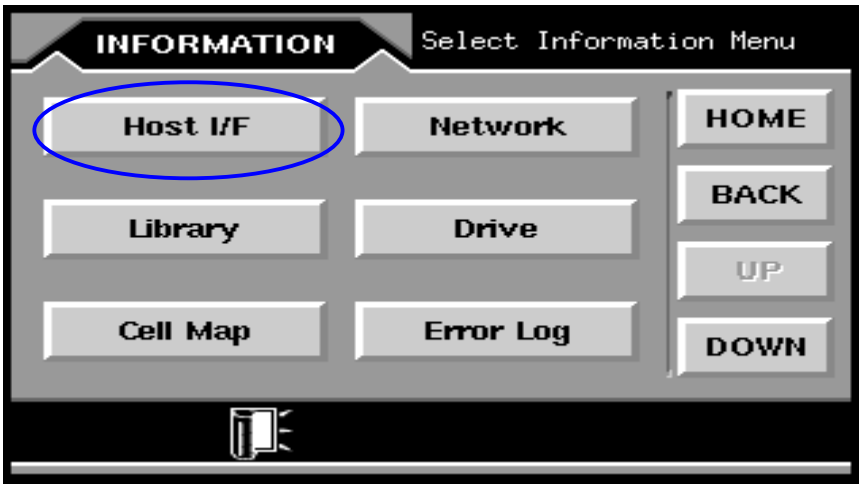


Figure 4.11 Selecting the [Host I/F] button

2) Press the adapter number of an adapter whose information you want to reference. The lowermost library adapter card installed has adapter number 0 and the uppermost has adapter number 3.

```
INFORMATION menu
  -Host I/F
   +Adapt#0
   +Adapt#1
```

4.3.2.1 Referencing the Target ID and LUN of each adapter

You can reference information on an adapter with a card installed in the adapter port.

1) Select the [Status] button.

```
INFORMATION menu
  -Host I/F
   -Adapt#0
    +Status
```

2) The following information about the specified adapter is displayed:
   - Adapter status (Normal/Error)
   - Interface type (Fiber Channel)
   - Topology (Fabric connection/AL [direct] connection)
   - Addressing mode (Hard address/Soft address)
   - LOOP ID
   - World Wide Node Name (WWNN) of the adapter
   - World Wide Port Name (WWPN) of the adapter
   - LUN value

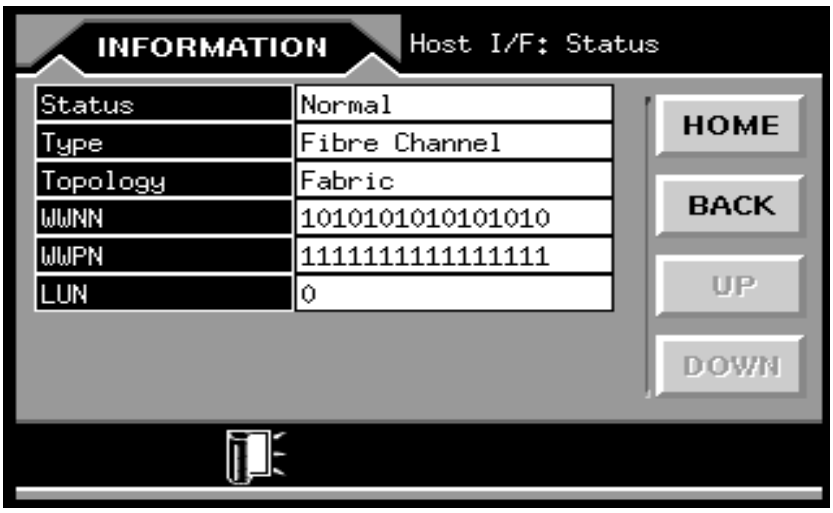


Figure 4.12 Host interface information reference window (When the Fabric connection is set)

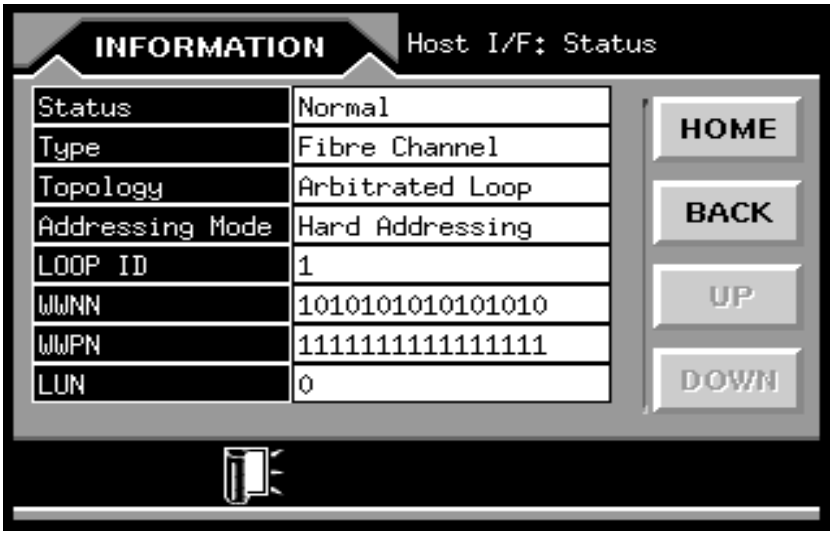


Figure 4.13 Host interface information reference window (When the AL connection/Hard address are set)

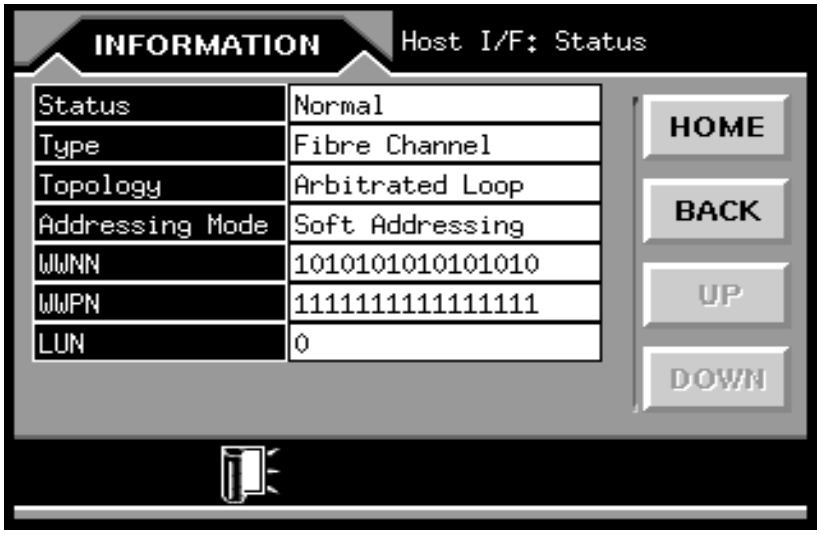


Figure 4.14 Host interface information reference window (When the AL connection/Soft address are set)

4.3.2.2 Referencing the host WWPN permitted for each adapter

It is possible to reference the host WWPN to which access is permitted set for each adapter (*1).

*1 It is possible to reference the host WWPNs for adapters whose adapter port is connected to a Fiber Channel.

1) Select the [Host WWPN] button.

```
INFORMATION menu
  -Host I/F
   -Adapt#0
    +Host WWPN
```

2) WWPNs of the hosts to which access is permitted for the specified adapter are displayed.

   The maximum number of permitted hosts is 8 for each adapter.

Remarks:

If no host WWPN is set, all hosts can be accessed.
If a host WWPN is set, access is permitted to the setup host only.

4.3.3 Referencing setup information for the library

It is possible to reference library information such as configuration information, Vendor ID, Product ID, and setup information.

1) Select the [Library] button from the INFORMATION menu.

```
INFORMATION menu
  +Library
```

2) The following information is displayed:
   - Model type/Model name
   - Configuration information
     -- Number of general cells (excluding cleaning cells, reserve cells, and diagnostics cells)
     -- Number of installed drives
     -- Number of installable magazines
   - Library setup information
     -- Library Vendor ID/Product ID
     -- Setup status of the auto cleaning function
     -- Setup status of the auto inventory function
     -- Setup status of the auto eject function
     -- Setup status of the fast load function

4.3.4 Referencing information about the drive

It is possible to reference the Target (Loop) ID of the drive, Addressing mode setting, Vendor ID, Product ID, and WWPN/WWNN.

1) Select the [Drive] button from the INFORMATION menu.

```
INFORMATION menu
  +Drive
```

2) Specify the drive number.

```
INFORMATION menu
  -Drive
   +DRV#00
   +DRV#01
```

3) The following information about the specified drive is displayed:
   - Type of interface (Fibre Channel)
   - Addressing mode (Hard Address/Soft Address)
   - LOOP ID
   - Vendor ID/Product ID
   - Serial number

- World Wide Node Name (WWNN) of the drive
- World Wide Port Name (WWPN) of the drive

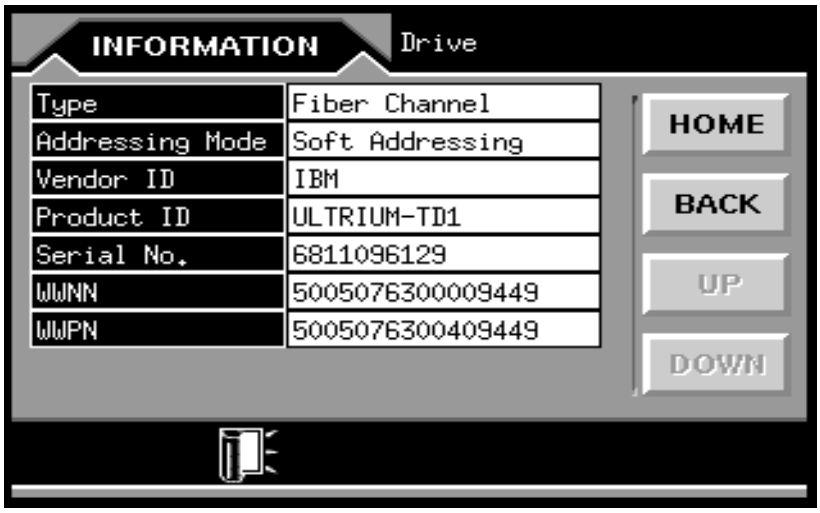


Figure 4.15 Drive information reference window (When the Soft address is set)

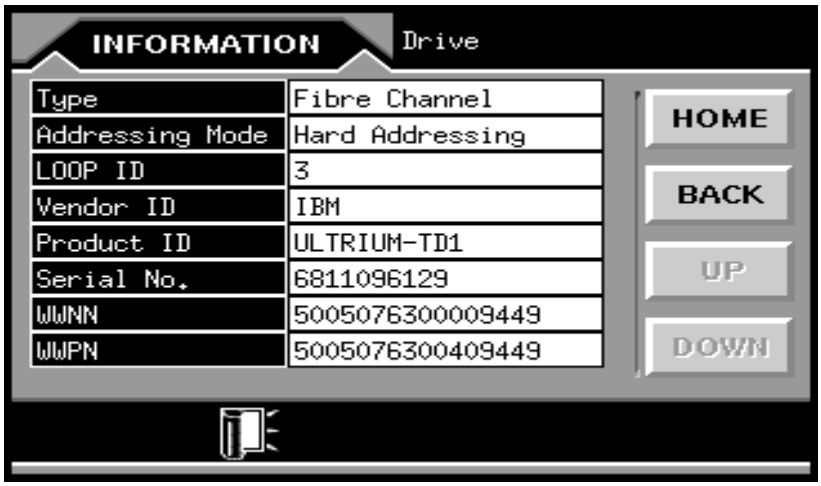


Figure 4.16 Drive information reference window (When the Hard address is set)

4.3.5 Referencing setup information for the network

It is possible to reference setup information for the IP address, subnet mask, gateway, and MAC address.

1) Select the [Network] button from the INFORMATION menu.

```
INFORMATION menu
  +Network
```

2) The following setup address information about the network is displayed:

- IP address
- Subnet mask
- Gateway
- MAC address

4.3.6 Referencing error information

It is possible to reference information about hardware errors that occurred and alarm errors that have not been released.

Remarks:

If a hardware error occurs, the Library Error icon is displayed in the home window. If an alarm error occurs, the Library Alarm icon is displayed in the home window.

First, select the [Error Log] button from the INFORMATION menu.

```
INFORMATION menu
  +Error Log
```

4.3.6.1 Referencing hardware error information for the library

To reference error information (such as the date/time of occurrence and error code) of the library, select the [Library Log] button.

```
INFORMATION menu
  -Error Log
   +Library Log
```

Ten pieces of error information in the past can be referenced.

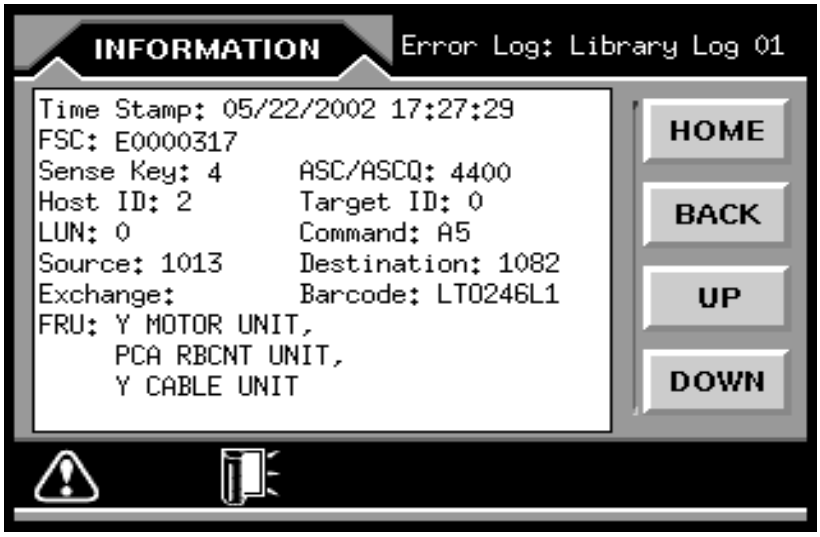


Figure 4.17 Hardware error information display window of the library

4.3.6.2 Referencing hardware error information for the drive

To reference error information (such as the date/time of occurrence and error code) of the drive, select the [Drive Log] button.

```
INFORMATION menu
  -Error Log
   +Drive Log
```

Ten pieces of past error information can be referenced.

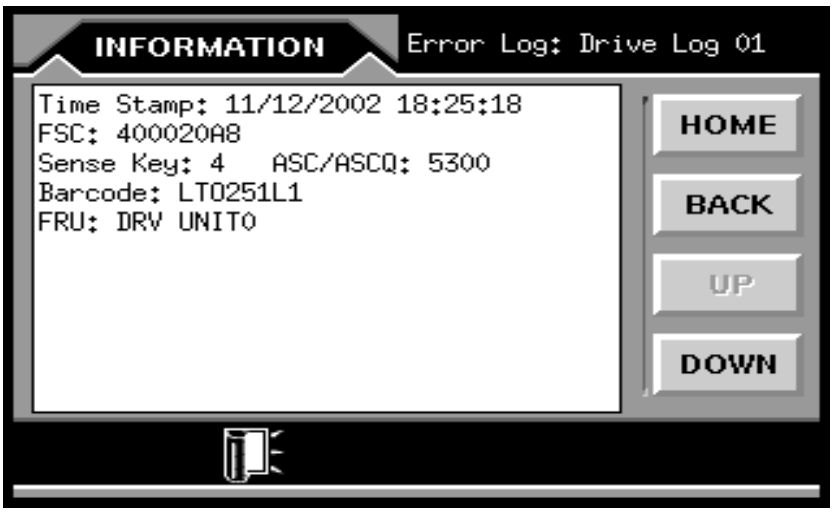


Figure 4.18 Hardware error information display window of the drive

4.3.6.3 Referencing alarm error information

1) If the [Alarm List] button is selected, contents about alarms that occurring currently are displayed (If no alarm is currently detected, the [Alarm List] button cannot be selected.).

```
INFORMATION menu
  -Error Log
   +Alarm List
```

Remarks:

The Library Alarm icon is also displayed on the operator panel if the FC cable of the FC card that is inserted in the library is not connected. In this case, FC Link Failure is listed on the alarm list. When the FC cable is connected, the Library Alarm icon is no longer displayed.

4.3.7 Referencing the version number of the library/drive

It is possible to reference the version number of firmware/hardware of the library/drive.

1) Select the [F/W Version] button from the INFORMATION menu.

```
INFORMATION menu
  +F/W Version
```

2) The following library/drive information is displayed:
   - Library
     -- Version of Overall Library
     -- Version of Library Control Firmware
     -- Version of Library Servo Firmware
     -- Version of Library Control Hardware
     -- Version of Library Servo Hardware
   - Drive module
     -- Version of Overall Drive Module
     -- Version of Overall Drive Control Firmware
     -- Version of Drive Unit Firmware

4.4 Setting the Target ID of the Drive

1) First, select the [Drive] button from the SETUP menu.

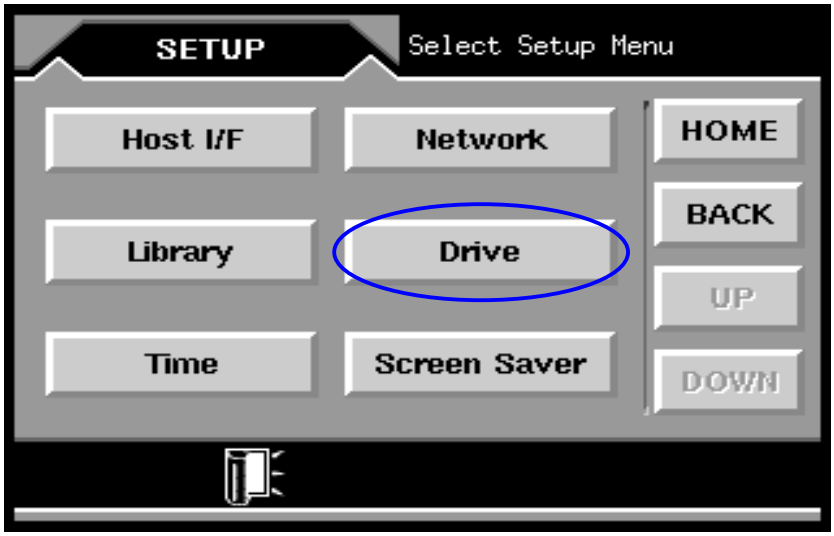


Figure 4.19 Selecting the [Drive] button

2) Then, specify the drive number.

```
SETUP menu
  -Drive
   +DRV#00
   +DRV#01
```

3) Select the Addressing mode (*1).

To specify the LOOP ID directly, select the [Hard Address] button.

```
SETUP menu
  -Drive
   -DRV#00
    +Hard address
```

To specify the LOOP ID automatically, select the [Soft Address] button.

```
SETUP menu
  -Drive
   -DRV#00
    +Soft Address
```

Remarks:

"Soft Address" is set by default.

4) If "Hard Address" is set, specify the LOOP ID.

Select the [Ten Key] icon and then enter LOOP ID using the ten-key pad.

The range of LOOP ID value is as follows:

LOOP ID: 0 - 125 (decimal)

If the entry is completed, select the [OK] button.

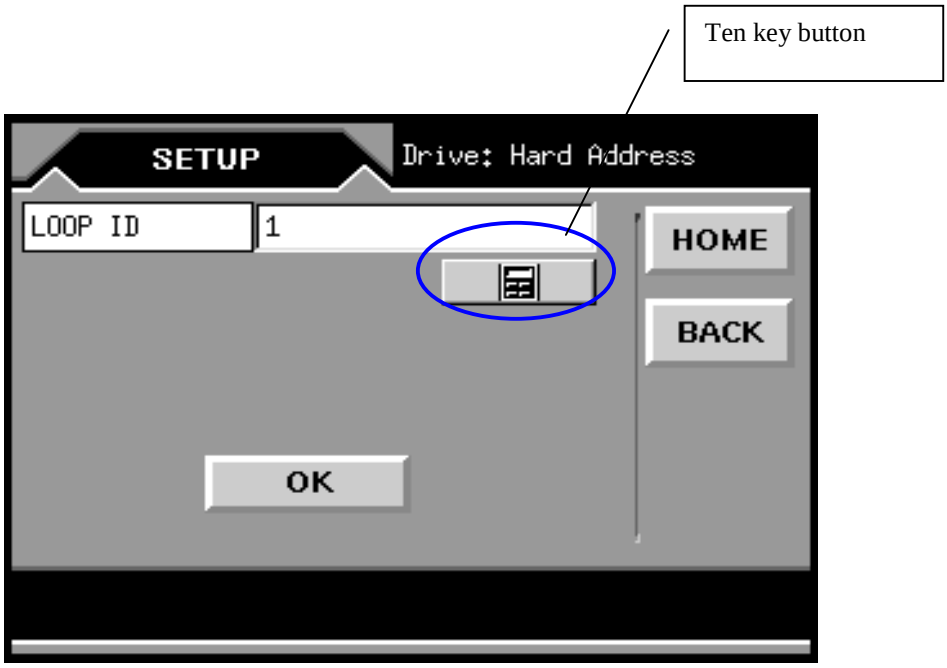


Figure 4.20 Target (LOOP) ID setup window of the drive

5) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the SETUP menu.

6) A window indicating that processing is under way is displayed. When the processing is completed, an end message window is displayed. This completes the settings. The drive is reset automatically and setup values are enabled.

Remarks:

If the drive is connected via a fiber channel switch, set the LOOP ID by setting "Soft Address."

If the drive is connected directly, set the LOOP ID by setting "Hard Address."

*1 Addressing mode and Hard Address/Soft Address

Addressing mode for Fiber Channel interface connection

Hard Address and Soft Address can be specified as the Addressing mode.

If "Hard Address" is set, the specified LOOP ID can be set (not ALPA).

If "Soft Address" is set, the LOOP ID is set automatically.

The following table lists the relationship between LOOP ID and ALPA.

Table 4.4 LOOP ID/ALPA correspondence table

ID [ALPA]	ID [ALPA]	ID [ALPA]	ID [ALPA]	ID [ALPA]	ID [ALPA]	ID [ALPA]
000 [EFh]	020 [C9h]	040 [A7h]	060 [76h]	080 [55h]	100 [34h]	120 [10h]
001 [E8h]	021 [C7h]	041 [A6h]	061 [75h]	081 [54h]	101 [33h]	121 [0Fh]
002 [E4h]	022 [C6h]	042 [A5h]	062 [74h]	082 [53h]	102 [32h]	122 [08h]
003 [E2h]	023 [C5h]	043 [A3h]	063 [73h]	083 [52h]	103 [31h]	123 [04h]
004 [E1h]	024 [C3h]	044 [9Fh]	064 [72h]	084 [51h]	104 [2Eh]	124 [02h]
005 [E0h]	025 [BCh]	045 [9Eh]	065 [71h]	085 [4Eh]	105 [2Dh]	125 [01h]
006 [DCh]	026 [BAh]	046 [9Dh]	066 [6Eh]	086 [4Dh]	106 [2Ch]	
007 [DAh]	027 [B9h]	047 [9Bh]	067 [6Dh]	087 [4Ch]	107 [2Bh]	
008 [D9h]	028 [B6h]	048 [98h]	068 [6Ch]	088 [4Bh]	108 [2Ah]	
009 [D6h]	029 [B5h]	049 [97h]	069 [6Bh]	089 [4Ah]	109 [29h]	
010 [D5h]	030 [B4h]	050 [90h]	070 [6Ah]	090 [49h]	110 [27h]	
011 [D4h]	031 [B3h]	051 [8Fh]	071 [69h]	091 [47h]	111 [26h]	
012 [D3h]	032 [B2h]	052 [88h]	072 [67h]	092 [46h]	112 [25h]	
013 [D2h]	033 [B1h]	053 [84h]	073 [66h]	093 [45h]	113 [23h]	
014 [D1h]	034 [AEh]	054 [82h]	074 [65h]	094 [43h]	114 [1Fh]	
015 [CEh]	035 [ADh]	055 [81h]	075 [63h]	095 [3Ch]	115 [1Eh]	
016 [CDh]	036 [ACh]	056 [80h]	076 [5Ch]	096 [3Ah]	116 [1Dh]	
017 [CCh]	037 [ABh]	057 [7Ch]	077 [5Ah]	097 [39h]	117 [1Bh]	
018 [CBh]	038 [AAh]	058 [7Ah]	078 [59h]	098 [36h]	118 [18h]	
019 [CAh]	039 [A9h]	059 [79h]	079 [56h]	099 [35h]	119 [17h]	

4.5 Setting Library Information

This section explains how to set host interface information for the library and the operation mode.

4.5.1 Setting information about the host interface

It is possible to set the Target (Loop) ID of the library, host WWPNs to which access is permitted, and registration list of host WWPNs to which access is permitted.

4.5.1.1 Setting the library Target (Loop) ID for each adapter

1) Select the [Host I/F] button from the SETUP menu.

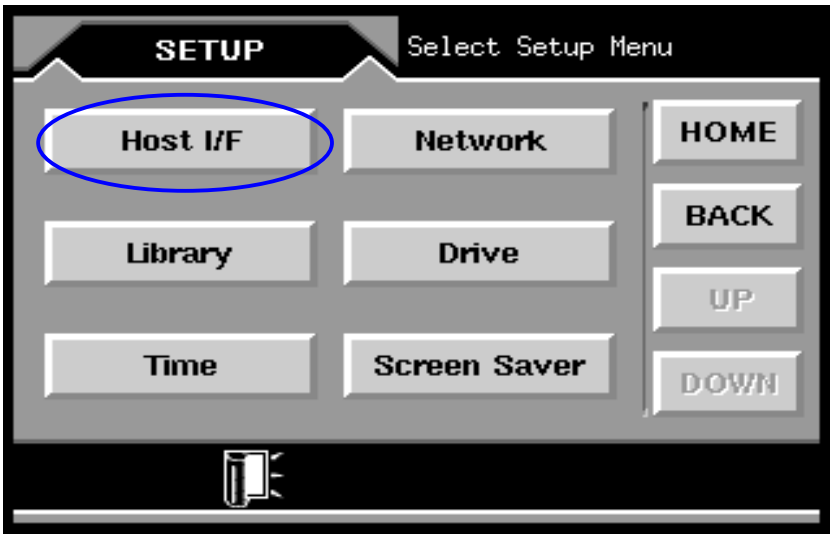


Figure 4.21 Selecting the [Host I/F] button.

2) Select the [target ID] button.

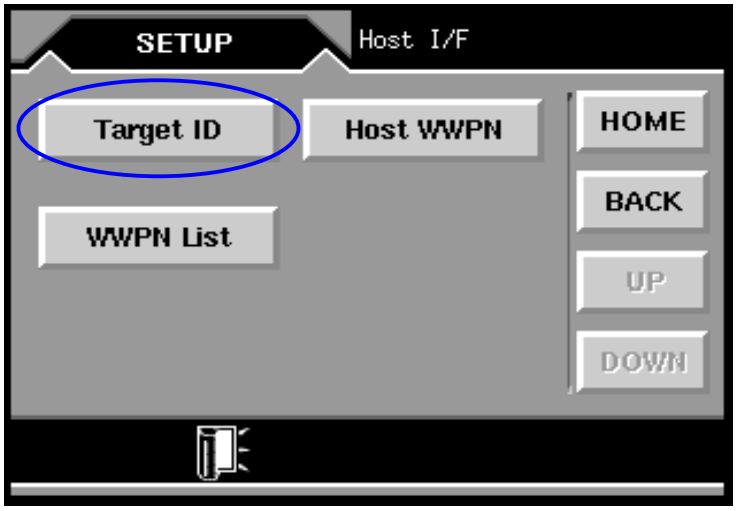


Figure 4.22 Selecting the [Target ID] button

3) Select the connected adapter number

```
SETUP menu
  -Host I/F
   -Target ID
    +Adapter#0
    +Adapter#1
```

4) Select the topology.

- For Fabric connection, select the [Fabric] button.

```
SETUP menu
  -Host I/F
   -Target ID
    -Adapter#1
     +Fabric
```

- For AL connection, select the [FC-AL] button.

```
SETUP menu
  -Host I/F
   -Target ID
    -Adapter#2
     +FC-AL
```

Remarks:

"Fabric" is set by default.

5) If the AL connection is selected, specify the Addressing mode.

Remarks:

If the Fabric connection is selected, the mode is set automatically.

- To set the LOOP ID directly, select the [Hard Address] button.

```
SETUP menu
  -Host I/F
   -Target ID
    -Adapter#2
     -FC-AL
      +Hard Address
```

- To set the LOOP ID automatically, select the [Soft Address] button.

```
SETUP menu
  -Host I/F
   -Target ID
    -Adapter#2
     -FC-AL
      +Soft Address
```

6) If "Hard Address" is set, specify the LOOP ID.

Select the [Ten Key] icon and then enter a LOOP ID using the ten-key pad.

The range of LOOP ID value is as follows:

LOOP ID: 0 - 125 (decimal)

If the entry is completed, select the [OK] button.

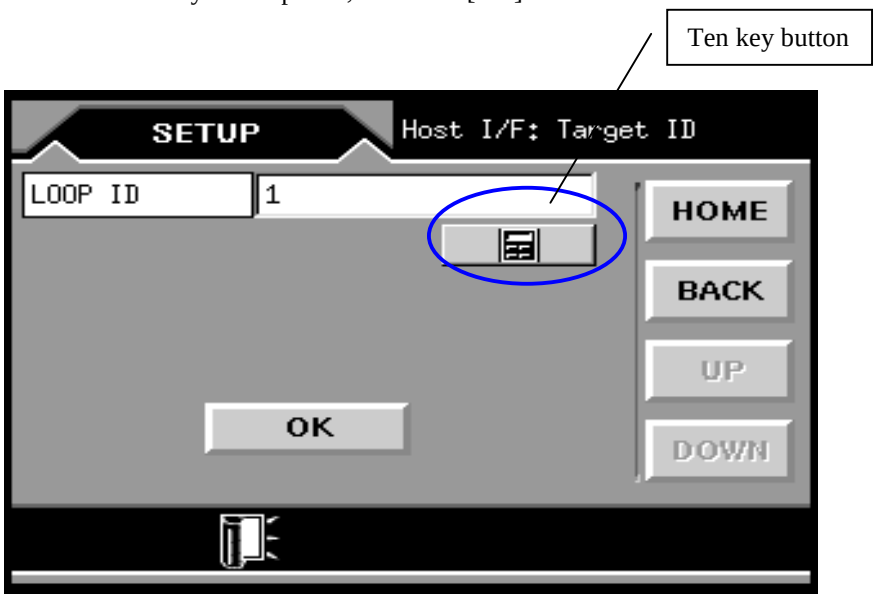


Figure 4.23 LOOP ID setup window of the host

7) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the previous window.

8) A window indicating that processing is under way is displayed. When the processing is completed, a window that requests to restart the library is displayed (*1).

   *1 To enable setup values, the library needs to be restarted.

4.5.1.2 Setting the host WWPN permitted for each adapter (If needed)

Set the WWPN to which access is permitted for each adapter. Up to eight hosts can be permitted for each adapter.

Remarks:

If no host WWPN is set, all hosts can be accessed.

If a host WWPN is set, access is permitted to the setup host only.

1) Select the [Host WWPN] button.

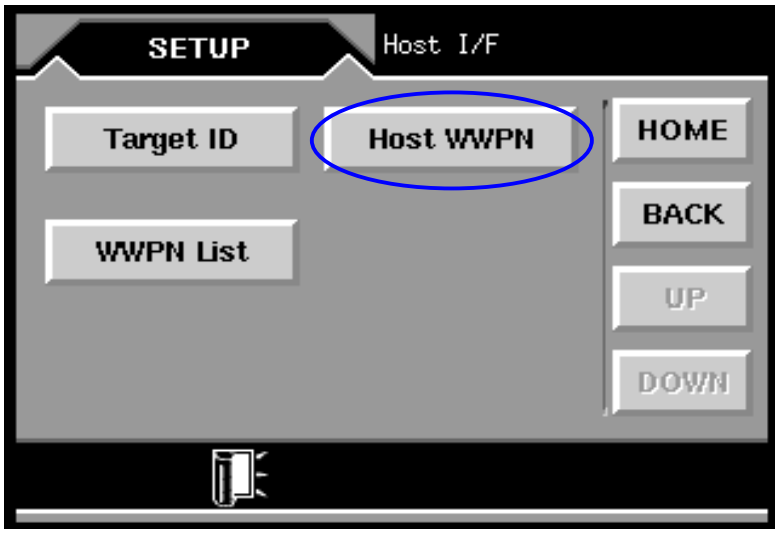


Figure 4.24 Selecting the [Host WWPN] button

2) Select the connected adapter number.

```
SETUP menu
  -Host I/F
   -Host WWPN
    +Adapter#0
    +Adapter#1
```

3) Set the permitted host WWPNs for the specified adapter.

   - Select the host WWPN from the list.

     Select the [List] button to display a list of registered WWPNs. Select the host WWPNs from this list.

Remarks:

For information about the method of creating a list of WWPNs, see Section 4.5.1.3, "Registering a host WWPN list."

- Enter the host WWPN directly

  Select the [Ten Key] icon and then enter the host WWPN using the ten-key pad. The WWPN set here is also added to the host WWPN list.

Remarks:

Access is permitted from all hosts by default.

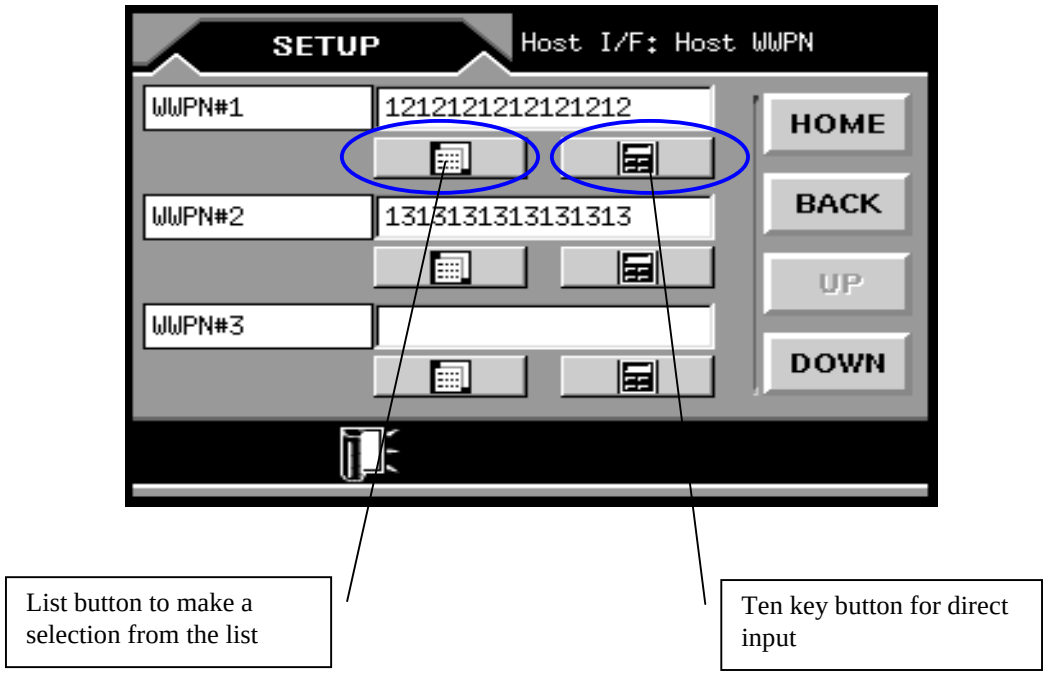


Figure 4.25 Host WWPN setting window

- Delete host WWPN that is already set

  Select the [Ten Key] icon of the item to be deleted, select the [AC] button for the reset, and then select the [OK] button.

  WWPN that has been set will be deleted (*1).

  *1 Even if a host WWPN is deleted, it is not removed from the WWPN list. For information about the method of removing it from the list, see Section 4.5.1.4 "Deleting from the WWPN list."

4.5.1.3 Registering a host WWPN list

It is possible to register a list of host WWPNs (up to 16) to which access is permitted.

1) Select the [WWPN List] button.

```
INFORMATION menu
  -Host I/F
   +WWPN List
```

2) Add WWPN to the WWPN list or delete WWPN from the WWPN list.

- Adding to the WWPN list

  Select the [Ten Key] icon and enter WWPN using the ten-key pad.

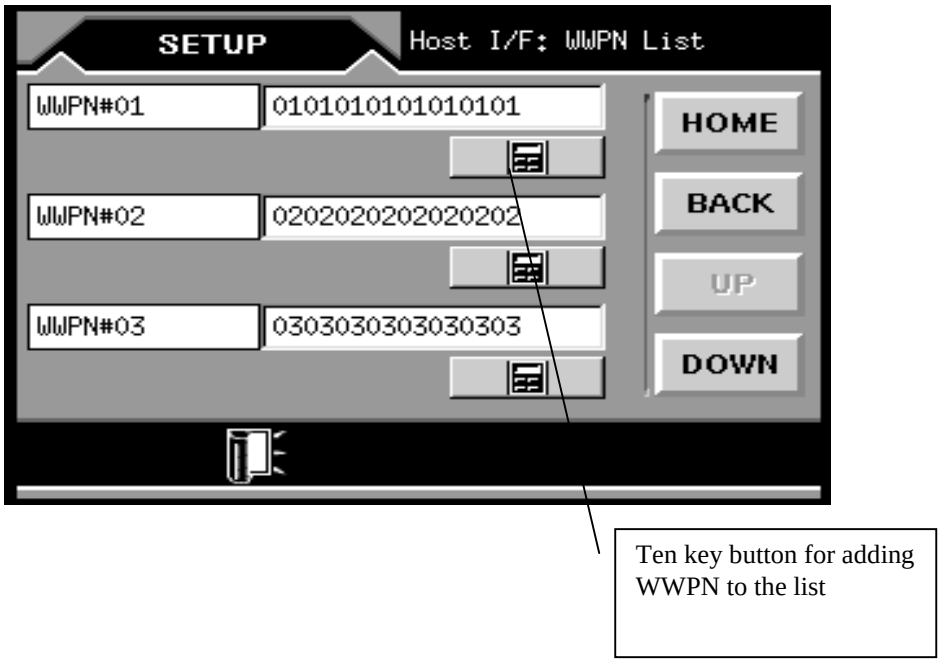


Figure 4.26 Host WWPN list registration window

4.5.1.4 Deleting from the WWPN list

Select the [Ten Key] icon of the item to be deleted, select the [AC] button for the reset, and then select the [OK] button.

4.5.2 Setting library information

First, select the [Library] button from the SETUP menu.

```
SETUP menu
  +Library
```

Set the library functions by using the Enable/Disable from the List buttons.

Auto Clean	Set whether to perform the auto cleaning for the drive. Enable: Perform the auto cleaning. Disable: Do not perform the auto cleaning.
Auto Inventory	Set whether to perform the auto inventory operation after power-on. Enable: Perform the inventory operation. Disable: Do not perform the inventory operation.
Auto Eject	Set whether to return any cartridge remaining in the drive during power-on automatically to its original cell by using the library. Enable: Return to the original cell. Disable: Do not return to the original cell.
Fast Load	Set whether to enable fast loading, which speeds up mounting for a drive. Enable: Enable the fast load function. Disable: Disable the fast load function.

Remarks:

These functions may not be usable depending on the backup software.
For more information, see the "Setup Guide" provided with the library or the manual of the applicable backup software.

4.5.3 Setting information about the network

This device has a LAN (TCP/IP protocol) communication function.

- Remote panel function

  You can reference or set up the library or drive in the Web browser.

Remarks:

1. The recommended browser is Microsoft Internet Explorer 5.0 to 6.0 and Netscape Navigator 4.7 to 4.78.
2. The remote panel uses Cookies and Java Script. These functions must be enabled in the browser that will be used.

- E-mailing function

  If the library or drive detects a hardware error, fault information is reported by e-mail.

Remarks:

For the settings of the e-mailing function, see Section 5.5.5, "Setting the e-mail function."

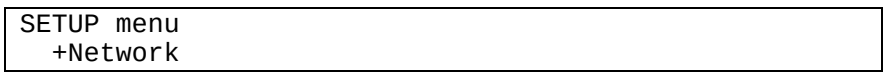
- REMCS function (REMote Customer Support system)

  This function links the customer and the maintenance management system of Fujitsu to provide support such items as recognizing error occurrences, reducing recovery time, and firmware delivery.

Remarks:

For information about the method of applying the REMCS function, contact the maintenance person.

1) Select the [Network] button from the SETUP menu.



2) For the IP address, subnet mask, and gateway IP address, select the [Ten Key] icon and then make entries using the ten-key pad.

   If the entries are completed, select the [OK] button.

3) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed.

   Selecting the [CANCEL] button displays the input window.

4) A window indicating that processing is under way is displayed. If the display switches to an end message, the setting is completed.

Remarks:

To enable setup values, the library needs to be restarted.

4.5.4 Setting the clock

If the library is set up for the first time the library clock needs to be set from the operator panel or remote panel.

The clock is required so that the time can be recorded in the error information.

1) Select the [Time] button from the SETUP menu.

```
SETUP menu
  +Time
```

2) For Year, Month, Day, Hour, and Minute, select the [Ten Key] icon and then make entries using the ten-key pad.

   If the entries are completed, select the [OK] button.

Remarks:

Years that can be entered are 2002 to 2037.

3) Select the [DOWN] button to go to the next window. Set the Time Zone using the arrow buttons.

   Table 4.5 lists the values that can be specified.

Table 4.5 World time zones

+13:00	Nukualofa
+12:00	Fiji, Kamchatka, Marshall Islands, Auckland, Wellington
+11:00	Magadan, Solomon Islands, New Caledonia
+10:00	Brisbane, Melbourne, Sydney, Guam, Port Moresby, Vladivostok, Hobart
+09:30	Adelaide, Darwin
+09:00	Tokyo, Osaka, Sapporo, Seoul, Yakutsk
+08:30	Moluccas Islands
+08:00	Beijing, Chongqing, Urumqi, Hong Kong, Perth, Singapore, Taipei
+07:00	Bangkok, Jakarta, Hanoi
+06:30	Rangoon
+06:00	Almaty, Dacca
+05:30	Mumbai (Bombay), Calcutta, Madras, New Delhi, Colombo
+05:00	Islamabad, Karachi, Ekaterinburg, Tashkent
+04:30	Kabul
+04:00	Abu Dhabi, Masqat, Tbilisi
+03:30	Tehran
+03:00	Bagdad, Kuwait, Nairobi, Riyadh, Moscow, St. Petersburg, Kazan
+02:00	Athens, Helsinki, Istanbul, Cairo, East Europe, Harare, Israel, Pretoria
+01:00	Berlin, Stockholm, Rome, Bern, Brussels, Vienna, Paris, Madrid, Amsterdam, Prague, Warsaw, Budapest
00:00	U.K., Lisbon, Monrovia, Casablanca
-01:00	Atlantic
-02:00	Mid-Atlantic
-03:00	Brasilia, Buenos Aires, Georgetown
-03:30	Newfoundland
-04:00	Atlantic Standard Time (Canada), Caracas, La Paz
-05:00	Eastern Standard Time (U.S., Canada), Bogota, Lima
-06:00	Central Standard Time (U.S., Canada), Saskatchewan, Mexico City, Tegucigalpa
-07:00	Mountain Standard Time (U.S., Canada), Arizona
-08:00	Pacific Standard Time (U.S., Canada), Tijuana
-09:00	Alaska
-10:00	Hawaii
-11:00	Midway Islands, Samoa
-12:00	Eniwetok, Kwajalein

4) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the input window.

5) A window indicating that processing is under way is displayed. If the display switches to an end message, the setting is completed.

4.5.5 Setting the screen saver

The starting time of the screen saver on the operator panel is set.

1) First, select the [Screen Saver] button from the SETUP menu.

```
SETUP menu
  +Screen Saver
```

2) For the time (minutes) in which the screen saver activates, select the Ten Key button and make an entry using the numeric keypad. When the entry is complete, select the [OK] button.

Remarks:

The time that can be entered is 1 to 99 minutes.

3) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the input window.

4) A window indicating that processing is under way is displayed. If the display switches to an end message, the setting is completed.

4.6 Opening the Magazine Door

The CAS magazine insertion door can be opened from the operator panel.

If the door is opened, the CAS Opened icon is displayed in the home window. If the door is closed after inserting a magazine, the library automatically searches for a cartridge inside the magazine.

1) The following two methods are available to enter the menu to open the magazine door:

   a) Select the [CAS] button in the common button area in the home window.

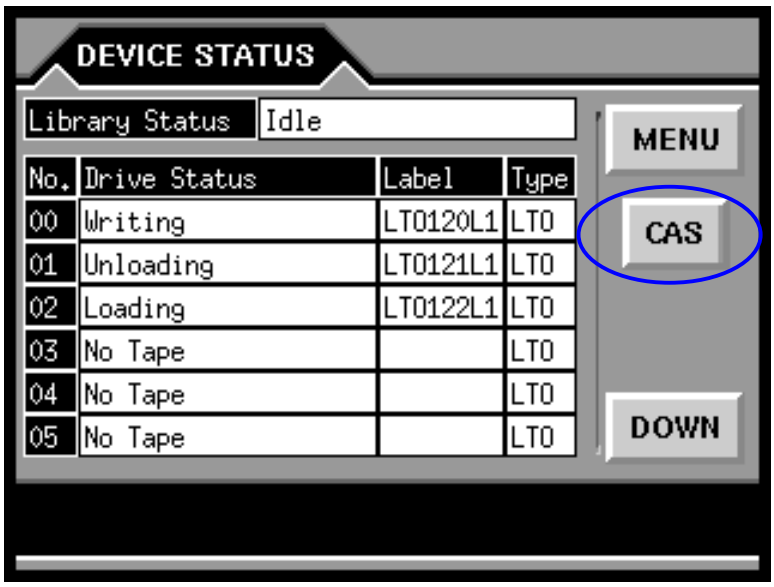


Figure 4.27 Selecting the [CAS] button

   b) Select the [CAS Open] button from the OPERATION menu.

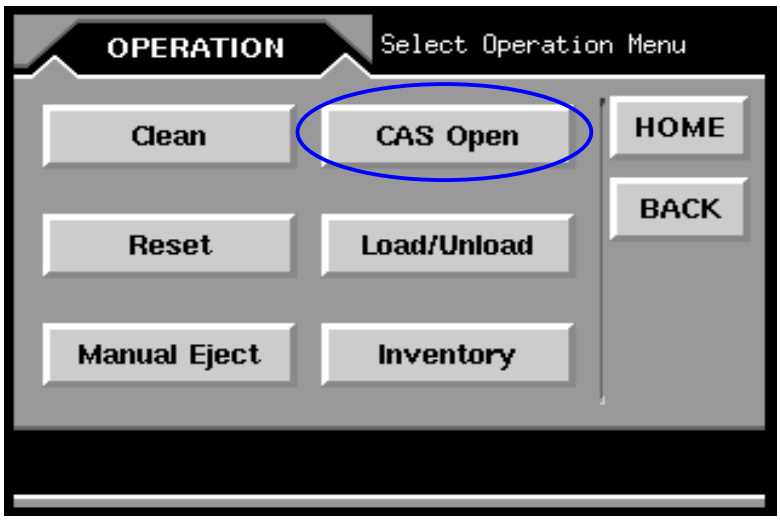


Figure 4.28 Selecting the [CAS Open] button

2) Select the magazine number of the magazine whose door is to be opened.

```
OPERATION menu
  -CAS Open
   +MGZ#0
   +MGZ#1
```

3) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the magazine selection window.

4) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, the door of the specified magazine opens.

4.7 Loading/Unloading a Cartridge

A cartridge inside the magazine is loaded into the drive or a cartridge loaded into the drive is unloaded into the magazine.

⚠ CAUTION

Data loss:
If a drive is used for the load/unload operation, the drive cannot be used from backup software.

Be sure to stop the operation of backup software before performing the load/unload operation.

4.7.1 Loading a cartridge contained in the magazine into the drive

1) Select the [Load/Unload] button from the OPERATION menu.

```
OPERATION menu
  +Load/Unload
```

2) Press the [Load] button.

3) Select a magazine.

   When a magazine is selected, the door of the specified magazine opens.

```
OPERATION menu
  -Load/Unload
   -Load
    +MGZ#0
    +MGZ#1
```

4) Specify a cartridge inside the specified magazine using a label number (more than one cartridge may be specified).

```
OPERATION menu
  -Load/Unload
   -Load
    -MGZ#0
     +LTO0062L1
     +LTO0063L1
```

5) Specify a drive to be loaded (you can specify as many drives as the cartridges specified above).

```
OPERATION menu
   -Load
    -MGZ#0
     +LTO0062L1
     +LTO0063L1
      +DRV#01
      +DRV#02
```

6) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the drive designation window.

7) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, loading to the specified drive is completed.

4.7.2 Unloading a cartridge loaded from the magazine

A cartridge in the drive loaded using the Load/Unload menu is unloaded into the specified magazine.

Remarks:

If no load/unload operation was performed using the Load/Unload menu before, this unload operation cannot be performed.

⚠ CAUTION

Data loss:
If a drive is used for the load/unload operation, the drive cannot be used from backup software.

Be sure to stop the operation of backup software before performing the load/unload operation.

1) Select the [Load/Unload] button from the OPERATION menu.

```
OPERATION menu
  +Load/Unload
```

2) Specify a drive to be unloaded (more than one drive may be specified).

3) Specify the magazine to be unloaded.

```
OPERATION menu
  -Load/Unload
   -DRV#00
   -DRV#01
    +MGZ#0
    +MGZ#1
```

4) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the magazine selection window.

5) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, unloading from the specified drive is completed.

4.8 Cleaning the Drive Manually

Use the cleaning cartridge contained in the special cell inside the library for cleaning the drive manually.

Remarks:

1. This operation can be performed only if the status of the drive displayed in the home window is "Required Clean" or "Need Clean."
2. Cleaning cannot be done if no cleaning cartridge dedicated to the drive to be cleaned is contained in the cleaning cell. To add a cleaning cartridge to the cleaning cell, see 4.9.1 "Inserting a cleaning cartridge."

   Also, cleaning cannot be carried out if the expiration dates of all cleaning cartridges dedicated for the drive to be cleaned have passed or an error has occurred in all cleaning cartridges.

   Eject cleaning cartridges that cannot be used and then insert ones that can be used. (For information on the method of ejecting a cleaning cartridge, see 4.9.2 "Ejecting a cleaning cartridge.")
3. A drive being cleaned is temporary placed offline. When cleaning is complete, the drive is automatically placed online.

1) Select the [Clean] button from the OPERATION menu.

```
OPERATION menu
  +Clean
```

2) Then, select the [Manual Clean] button.

```
OPERATION menu
  -Clean
   +Manual Clean
```

3) Specify the drive to be cleaned using the [Drive number] button.

Remarks:

Drives that can be selected are only those that require cleaning.

```
OPERATION menu
  -Clean
   -Manual Clean
    +DRV#00
    +DRV#03
```

4) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the drive designation window.

5) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, cleaning of the specified drive is completed.

4.9 Inserting/Ejecting a Cleaning Cartridge

This section explains how to insert and eject a cleaning cartridge.

Remarks:

A cleaning cartridge can be used only a limited number of times. If a cleaning cartridge in the cleaning cell has reached its use limit, the cleaning cartridge can no longer be used and the Exchange Clean Tape icon lights in the icon area of the operator panel. If this icon is lit, eject the cleaning cartridge, which is now unusable, and replace it with a new cleaning cartridge.

4.9.1 Inserting a cleaning cartridge

A cleaning cartridge is inserted into the cleaning cell.

Remarks:

This operation can be performed only if there is an available cleaning cell.

1) Select the [Clean] button from the OPERATION menu.

```
Operation MENU
  +Clean
```

2) Then, select the [Insert CLNTape] button.

```
Operation MENU
  -Clean
   +Insert CLNTape
```

3) Specify the magazine.

```
Operation MENU
  -Clean
   -Insert CLNTape
    +MGZ#0
    +MGZ#1
```

4) Specify the magazine into which the cleaning cartridge to be inserted into the cleaning cell is inserted.

Remarks:

1. Only the numbers of cells into which a cleaning cartridge is inserted are displayed.
2. If you specify the cell number of a cell containing a cleaning cartridge that cannot be used, a message indicating that the cell number cannot be specified is displayed.

```
Operation MENU
  -Clean
   -Insert CLNTape
    -MGZ#0
     +CAS Cell#00
     +CAS Cell#03
```

5) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the cleaning cartridge selection window.

6) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, insertion of the cleaning cartridge is completed.

4.9.2 Ejecting a cleaning cartridge

A cleaning cartridge in the cleaning cell is ejected into the magazine.

1) Select the [Clean] button from the OPERATION menu.

```
OPERATION menu
  +Clean
```

2) Then, select the [Eject CLNTape] button.

```
Operation MENU
  -CLEAN
   +Eject CLNTape
```

3) Specify the cleaning cartridge in the cleaning cell.

   For each cleaning cartridge, the label name (Label), media type (Type), usage count/available count (Use/Max), and status (Status) are displayed.

No.	Label	Type	Use/Max	Status
01	CLNI01L1	LTO-C	10/50	Normal
02	CLNI02L1	LTO-C	50/50	Limit
03	CLNI03L1	LTO-C	45/50	Error

In the status item, one of Normal, Limit, and Error is displayed:

- Normal: Indicates a normal state.
- Limit: Indicates that the maximum usage count has been reached.
- Error: Indicates that the cleaning cartridge cannot be used due to a cartridge error.

Remarks:

Cleaning using the manual cleaning function or auto-cleaning function can be performed on cleaning cartridges whose status is Normal. Eject cleaning cartridges whose status is Limit or Error.

4) Specify the magazine.

```
OPERATION menu
  -CLEAN
   -Remove CLNTape
    -CLNI02L1
     +MGZ#1
     +MGZ#3
```

Remarks:

Only magazines with available space can be selected.

5) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the magazine designation window.

6) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, ejection of the specified cleaning cartridge is completed.

4.10 Releasing a Hardware Error of the Library/Drive

If a hardware error occurs in the library or drive, recovery operation to release the error is performed.

Remarks:

During this recovery operation, the library and drive cannot be used for any software backup operation. Wait to use them until after the recovery operation is complete.

- If a hardware error of the library occurs, "error code" is displayed in the Library Status table in the home window. Also, the Library Error icon is lit in the icon area.

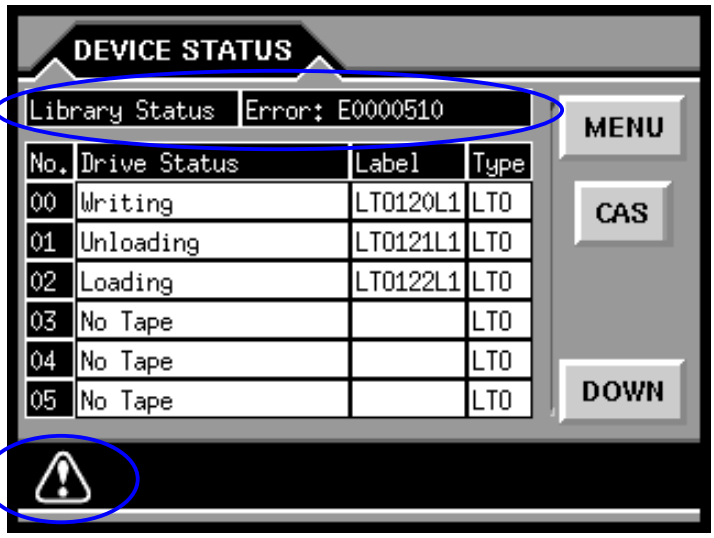


Figure 4.29 Home window displaying a library hardware error

- If a hardware error of the drive occurs, "error code" is displayed in the Drive Status table in the home window.

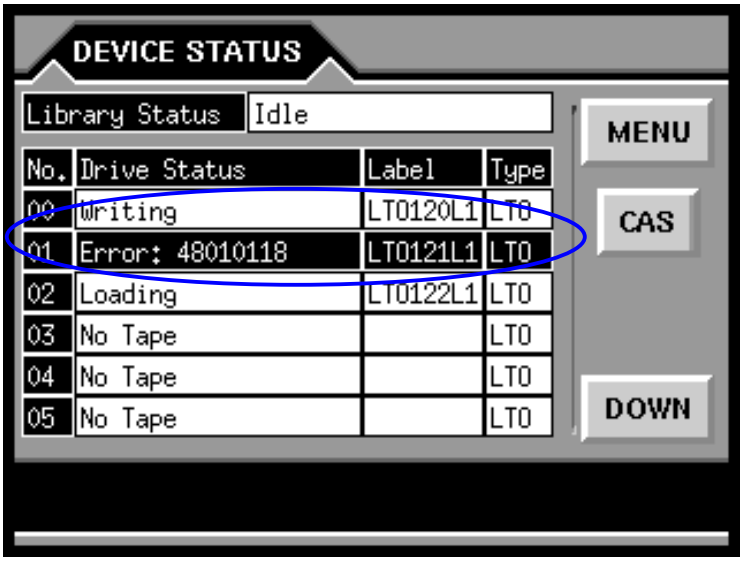


Figure 4.30 Home window displaying a drive hardware error

1) Select the [Reset] button from the OPERATION menu.

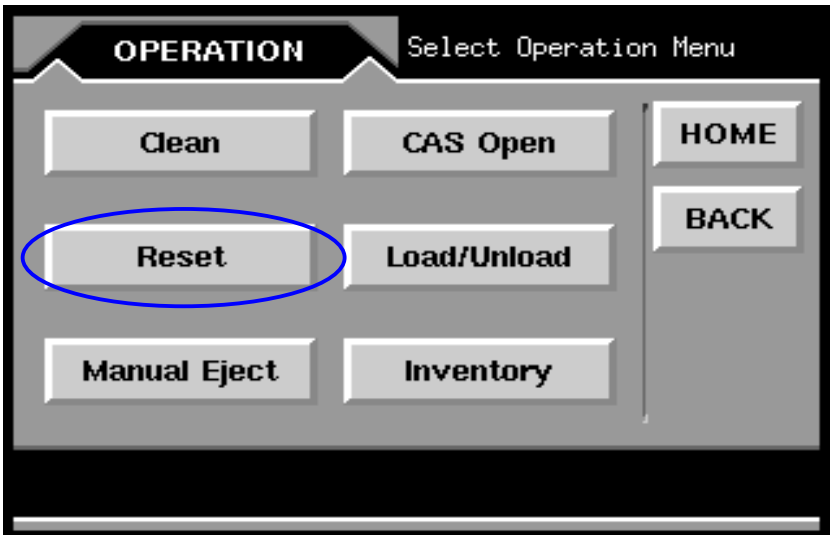


Figure 4.31 Selecting the [Reset] button

2) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the OPERATION menu window.

3) A message window indicating that processing is under way is displayed and an attempt is made to release all errors

   If the display changes to an end message, error releasing is completed.

Remarks:

The locations of errors that could not be released are displayed.

4.11 Releasing the Front Door Open Status

If the front door is opened, the Front Door Open icon is lit in the icon area.

Remarks:

The library is in the Not Ready state.

If the front door is closed, the library automatically takes inventory, the management information of cartridges managed by the library is updated, and the library returns to the online state.

Confirm at this point that the Front Door Opened icon, previously lit in the icon area of the operator panel, is now off.

4.12 Unloading a Cartridge Loaded from the Host

When a cartridge is loaded by the host, data on it is accessed by the host. When the access is completed, the host unloads the cartridge to its original cell. If a hose failure or some other cause disables communication with the host, the host cannot unload the cartridge to its original cell.

In such a situation, you can unload the cartridge to its original cell as follows:

Remarks:

The drive used for this operation is made automatically offline. When the unloading is completed, the drive becomes automatically online.

```
OPERATION menu
  +Manual Eject
```

1) Select the [Manual Eject] button from the OPERATION menu.

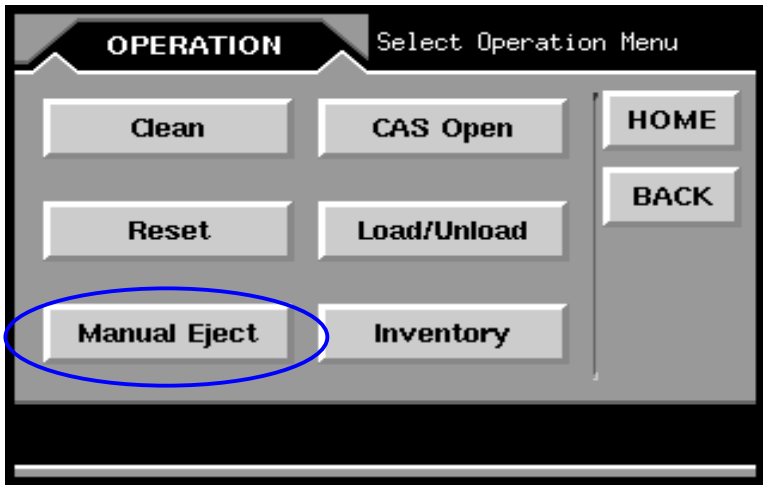


Figure 4.32 Selecting the [Manual Eject] button

2) Specify the drive to be unloaded.

```
OPERATION menu
  -Manual Eject
   +DRV#01
   +DRV#02
```

Only drives in which a cartridge is loaded can be specified.

3) A confirmation message window is displayed.

Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the drive designation window.

4) A message indicating that processing is under way is displayed on the screen. If the display changes to an end message, unloading of the specified drive is completed.

4.13 Making an Inventory

The cartridge management information for the general cell and magazine cell is updated.

Remarks:

1. At this point, the library enters the "Not Ready" state.
2. Automatic inventory is not performed if the auto-inventory function is disabled when the library is turned on.
   If you replace or change the position of a cartridge, execute the Inventory operation from the operator panel to take inventory and update the library's cartridge management information.

1) Select the [Inventory] button from the OPERATION menu.

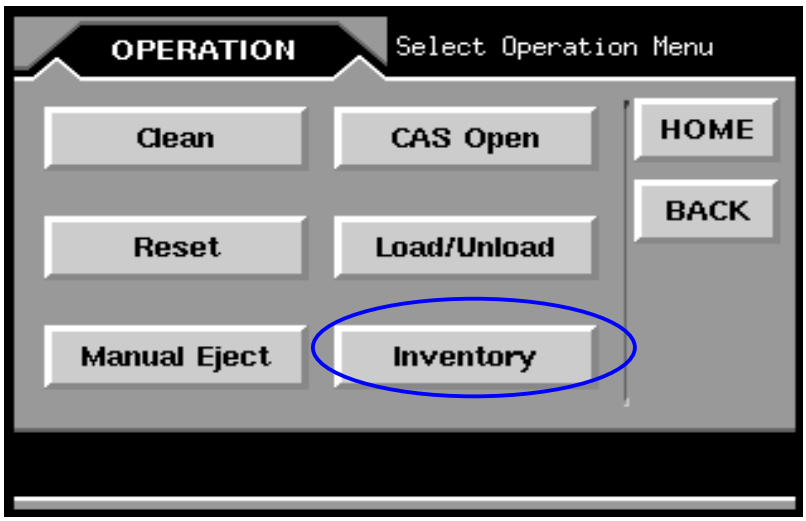


Figure 4.33 Selecting the [Inventory] button

2) A confirmation message window is displayed.

   Select the [OK] button if it is OK to proceed. Selecting the [CANCEL] button displays the OPERATION menu.

3) If the inventory operation is completed, an end message window is displayed, completing the update of cartridge management information.

Chapter 5 Remote Panel Operation

5.1 Overview

5.2 Referencing the Status of Drive/Library

5.3 Referencing Library Information

5.4 Setting Target ID of the Drive

5.5 Setting Library Information

5.6 Operating the Library

5.1 Overview

The remote panel can be used to perform operations such as the library and drive status reference, library and drive settings, and drive cleaning from the general-purpose browser (*1) such as PC via LAN.

*1 The recommended browser is Microsoft Internet Explorer 5.0 to 6.0 and Netscape Navigator 4.7 to 4.78.

Before using the remote panel, you need to make network settings from the operator panel to set to be enabled an IP address, subnet mask, and gateway. After making the settings, restart the library and specify the following URL:

http:// <IP address specified for the library>

The window shown in Figure 5.1 is displayed.

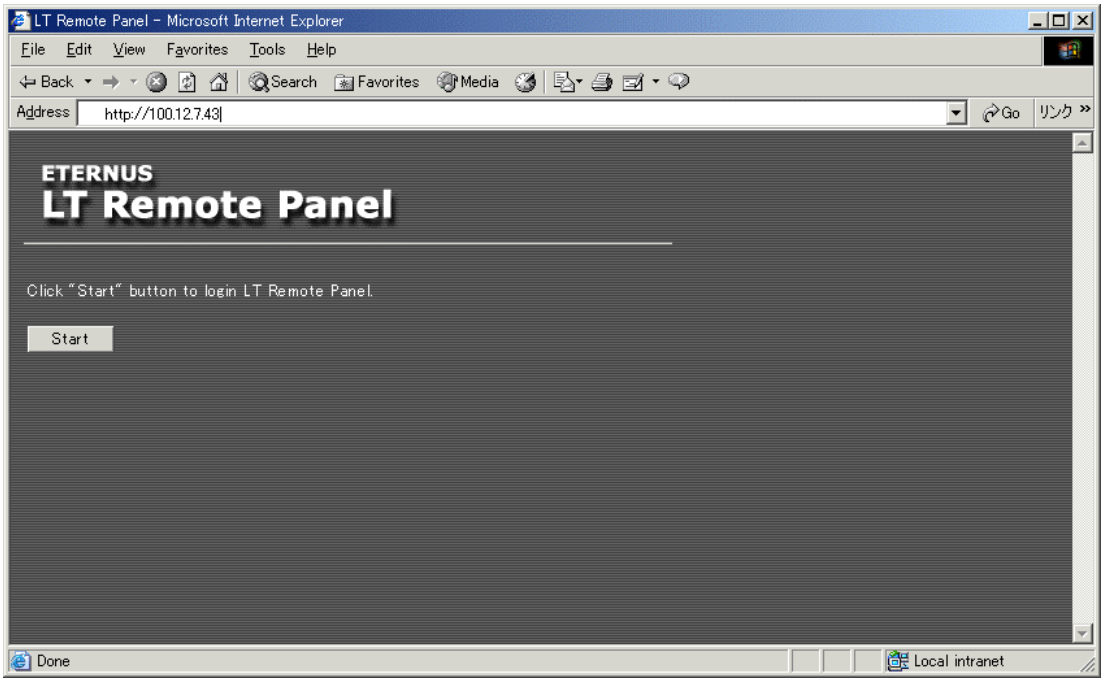


Figure 5.1 Remote panel starting window

Remarks:

The web panel uses "Cookie" and "Java Script." Enable in advance their settings in the browser to be used.

5.1.1 Login method

1) Click the [Start] button. The following login window is displayed.

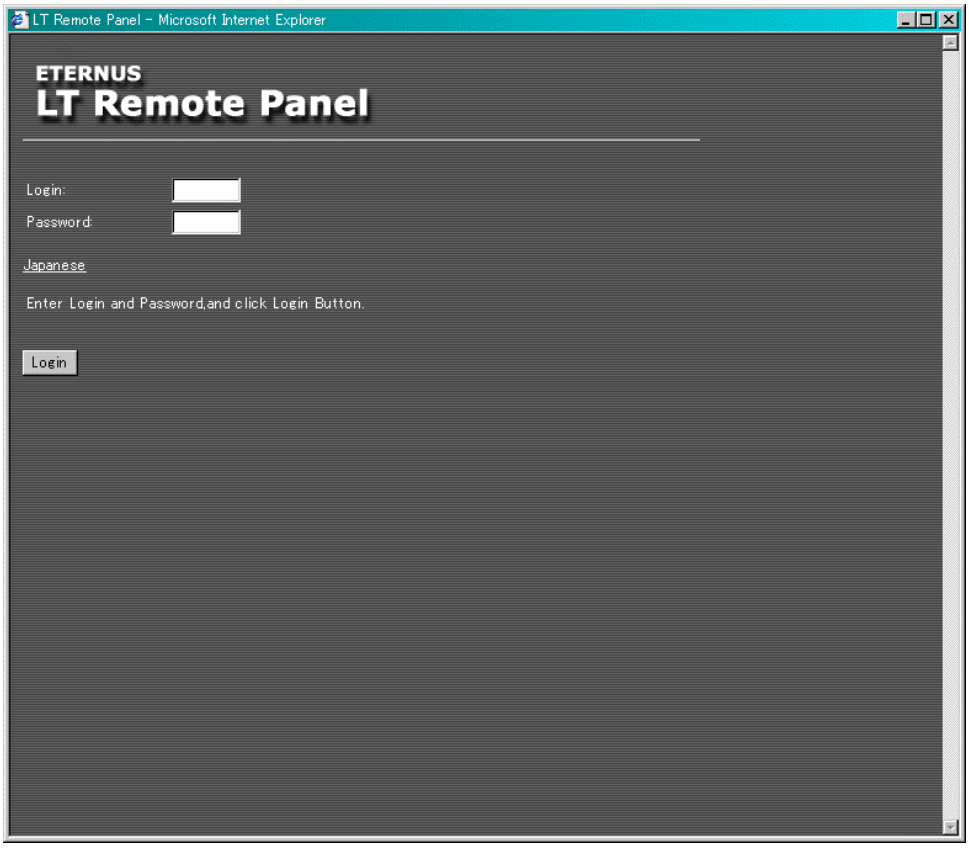


Figure 5.2 Login window

2) After entering the login and password, click the [Login] button.

Remarks:

Two login accounts, "General" and "Administrator," are available; their login/passwords differ.

Depending on the login account, the operation menu of the remote panel is restricted.

Login account	Operable menu	Login/password
General	Status reference only	user/user (default)
Administrator	Status reference, settings, and operations are allowed	admin/admin (default)

Multiple persons can be logged in simultaneously with a general account. However, only one person can be logged in with an administrator account.

3) If the entered login and password are correct, the home window is displayed.

Remarks:

1. If the login is fails, the following window is displayed.

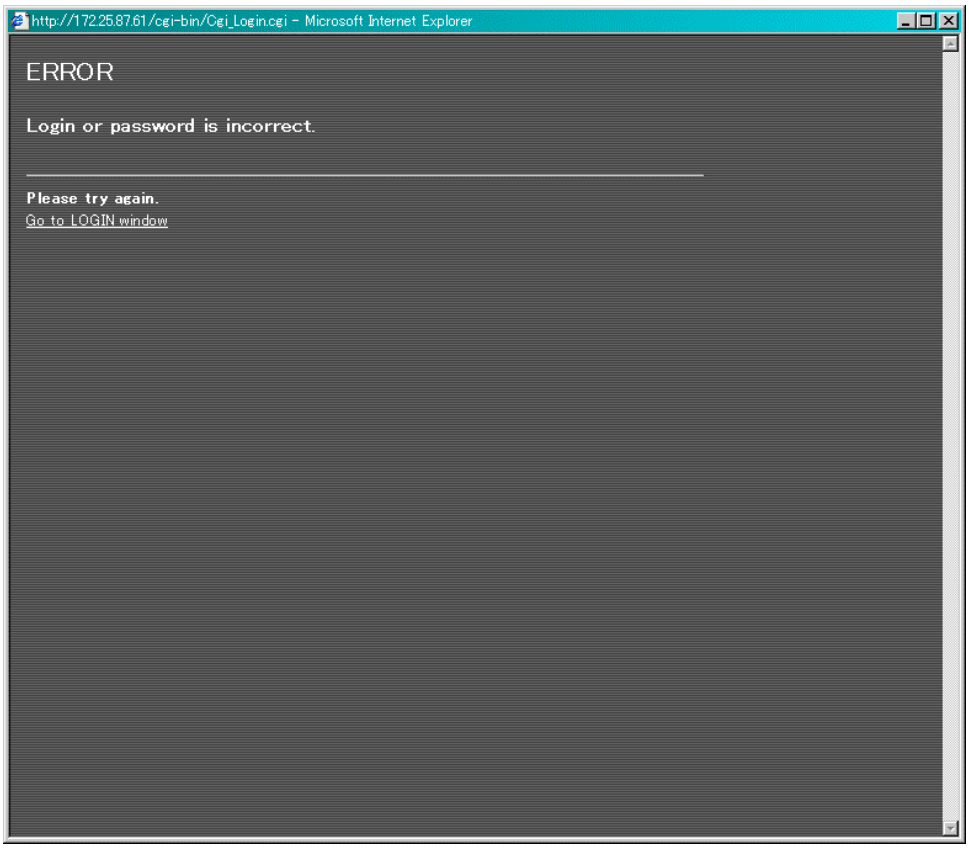


Figure 5.3 Window displayed when the login fails

Click "Go to LOGIN window" to return to the login window. Enter the correct values.

Remarks:

2. If an attempt is made to log in with an administrator account even if the administrator account has already been used for login, or an attempt is made to log in after quitting operations without logging off when the administrator account was last used (including restart following forced termination due to a browser error), the following window is displayed:

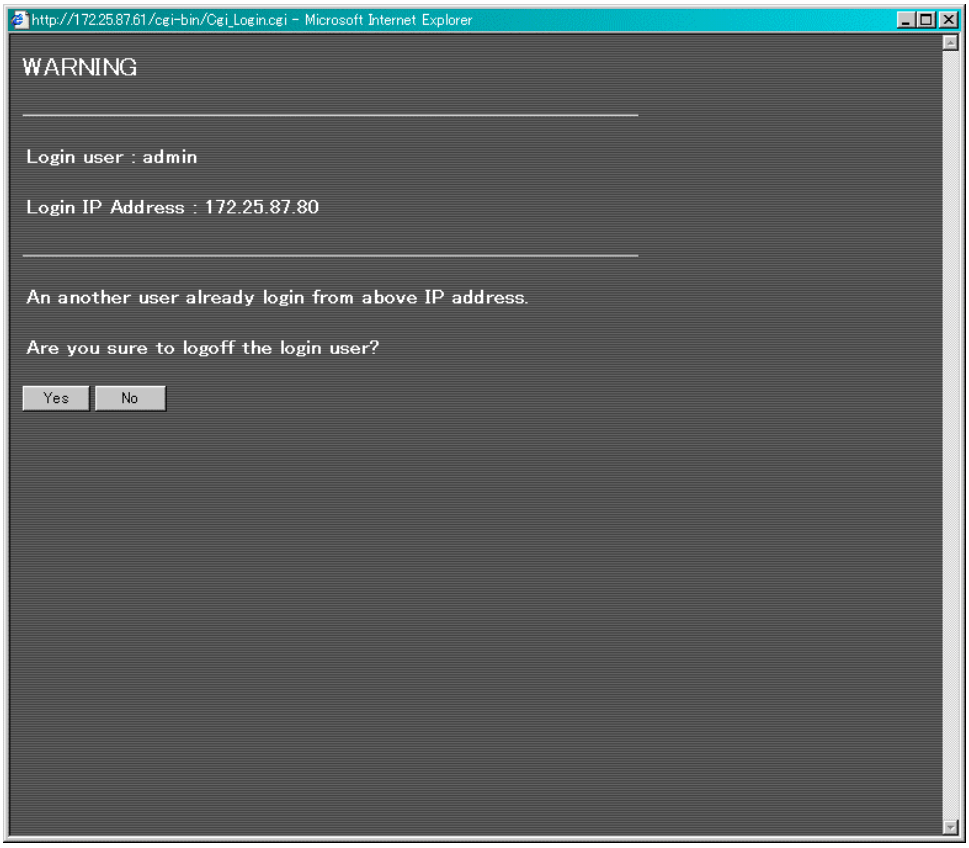

http://172.25.87.61/cgi-bin/Cgi_Login.cgi - Microsoft Internet Explorer
WARNING
Login user : admin
Login IP Address : 172.25.87.80
An another user already login from above IP address.
Are you sure to logoff the login user?
Yes
No

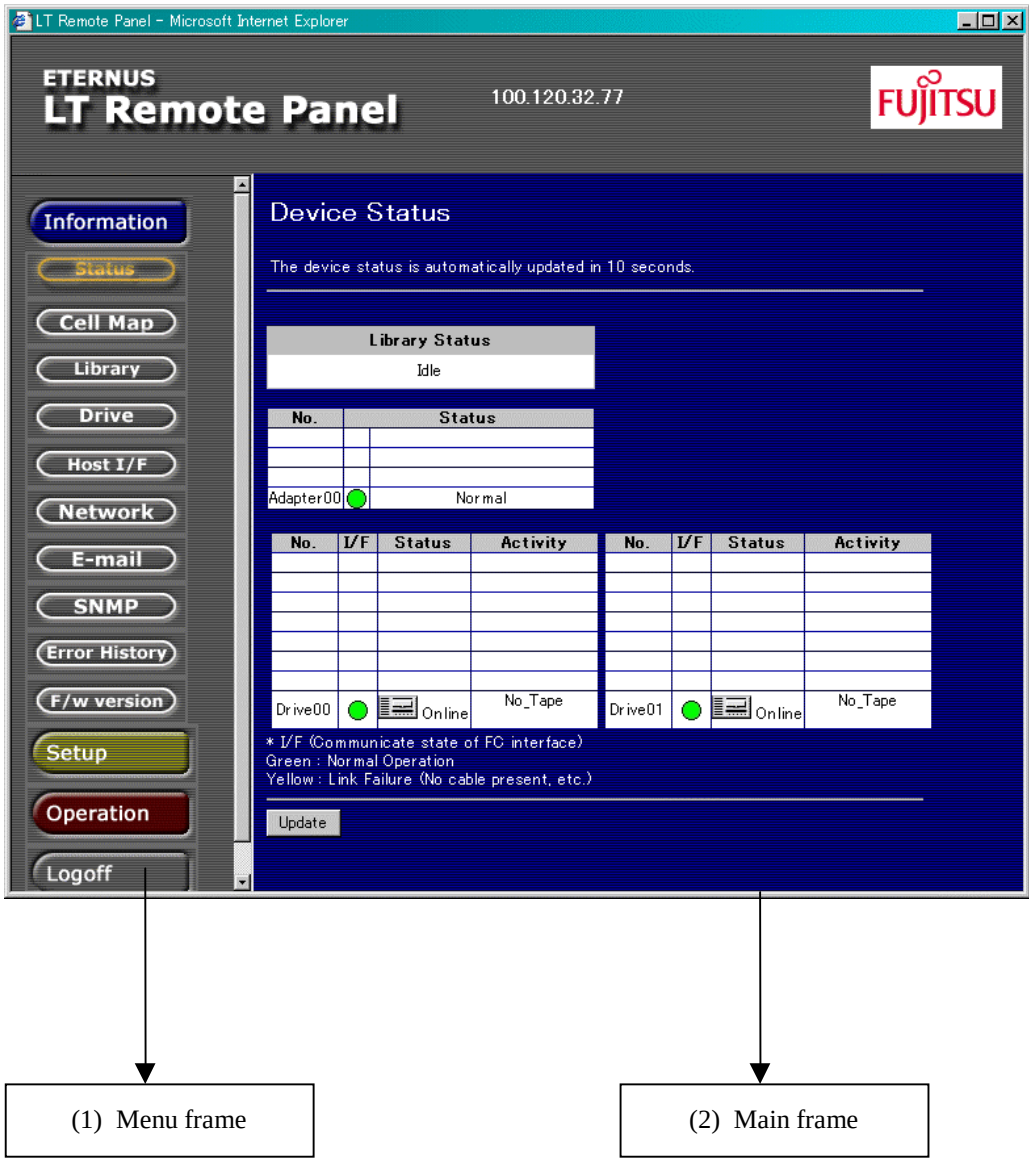
Figure 5.4 Window displayed for duplicate login

To forcibly log off after checking the message contents, click the [YES] button. After returning to the login window, log in again. (If the [YES] button is clicked, operations from the Web panel to which currently logged in is prohibited.)

To not forcibly log off, click the [NO] button (If accessed via a proxy server, the IP address of the proxy server is displayed as Login IP Address.).

5.1.2 Frame configuration

The configuration of the menu frame and main frame on the Web panel has the following appearance:



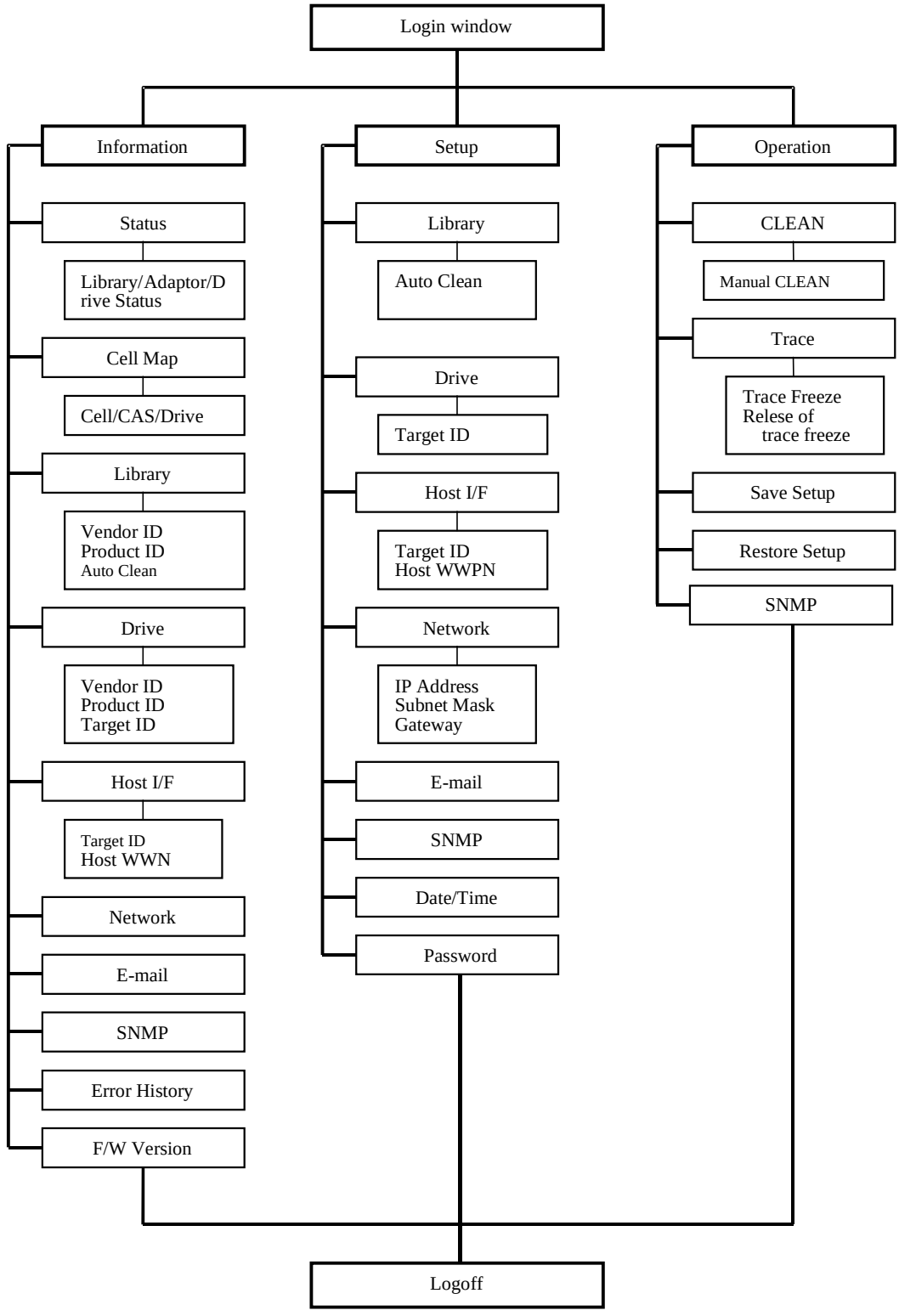
(1) Menu frame — Menus for the status reference/settings/operations are displayed.

(2) Main frame — A window for performing settings/operations of the menu selected from the menu frame is displayed.

Figure 5.5 Frame configuration of the remote panel

5.1.3 Menu tree

The menu structure of the remote panel is as shown below:



5.2 Referencing the Status of Drive/Library

If logged in normally from the login window of the remote panel, the home window is displayed so that the status of the drive, library, and adapter can be referenced.

Remarks:

The home window is automatically updated every 10 seconds.

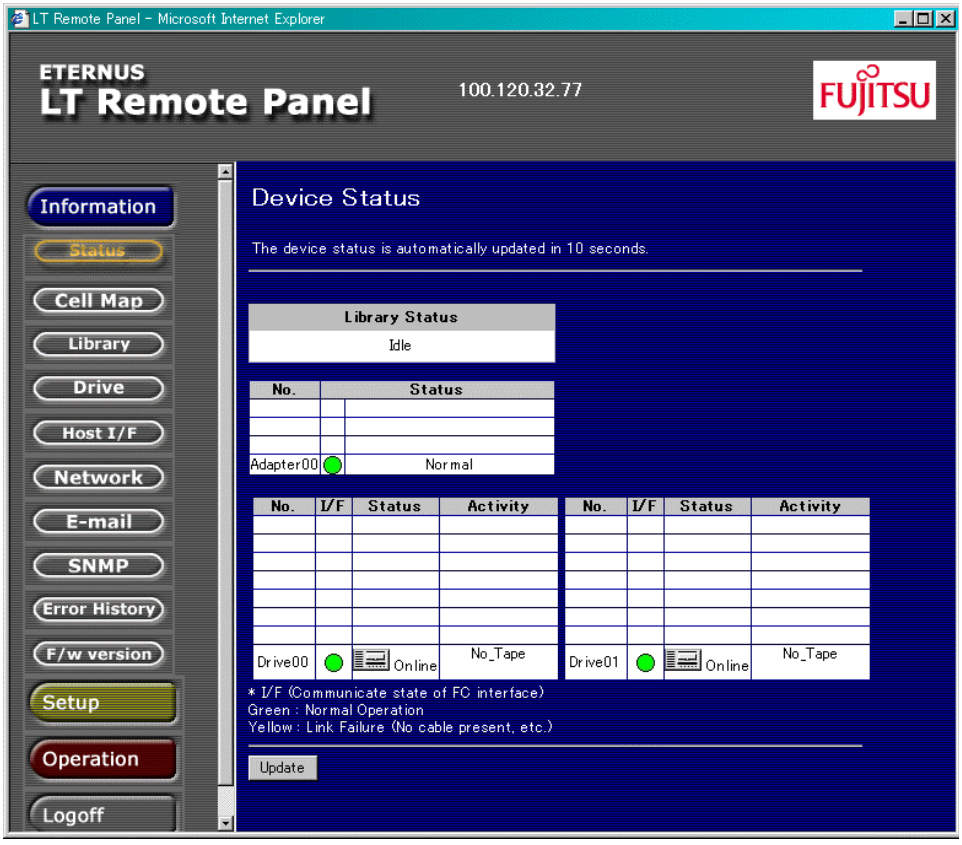


Figure 5.6 Status reference window of the drive/library

The drive status is indicated by the following icons:

Icon	Status
	Indicates that the drive is normal.
	Indicates that the drive requires cleaning, the drive is turned off, a cartridge error has occurred, or the drive is not installed. (The error status can be identified by the character attached to the icon.)
	Indicates that an error has occurred in the drive or the cooling fan of the drive has failed (The error status can be identified by the character attached to the icon.).

The drive I/F status is indicated by the following icons:

	Indicates that the I/F is normal.
	Indicates that the FC cable is disconnected.

The following types of status are displayed in the home window.

- Library statuses

  The status of the library can be any of the following.

Initializing	Indicates that the library is being initialized.
Idle	Indicates that the library has stopped normally.
Moving	Indicates that the robot is operating.
Checking Inventory	Indicates that the library is taking inventory of the CAS or cells.
Front Door Opened	Indicates that the front door is open.
Offline	Indicates that the library is offline.
Error	Indicates that an error occurred in the library. The error code is also displayed.
Firmware Updating	Indicates that the firmware is being updated.

Figure 5.7 shows the upper frame of the remote panel when the library has no errors, and Figure 5.8 shows the upper frame when the library has an error.

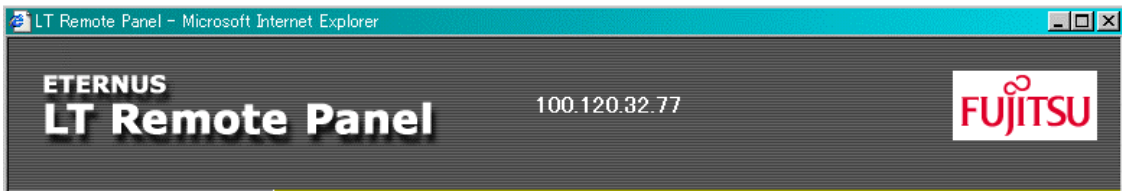


Figure 5.7 Normal window display (no errors) (upper frame)

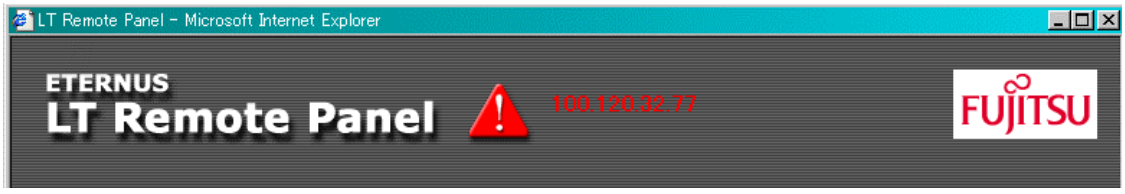


Figure 5.8 Window display when there is an error (upper frame)

- Library warning message

  The following library warning messages are used:

Barcode Reader Error	Indicates that the Barcode Reader has failed.
CM Reader Error	Indicates that the Cartridge Memory Reader has failed.
CAS Error	Indicates that the CAS unit has failed.
CELL Error	Indicates that a CELL has failed.
Battery Alarm	Indicates that a battery alarm has been detected.
Fan-1 Alarm	Indicates that a FAN-1 alarm has been detected.
Fan-2 Alarm	Indicates that a FAN-2 alarm has been detected.
CAS Open Error	Indicates that an error occurred when opening the CAS door.
Front Door Open	Indicates that the front door is open.

- Adapter status

  The following types of adapter status are used:

Normal		Indicates that the adapter is normal.
Error		Indicates that the adapter is in error.
Not Connect		Indicates that the FC cable is disconnected.

- Drive status

  The following two types of drive status are used:

  Drive status 1

Online	Indicates that the drive is normal.
Offline	Indicates that the drive is offline.
Error	Indicates that an error has occurred in the drive. The error code is also displayed.
Fan Alarm	Indicates that the cooling fan of the drive unit has failed.
Media Error	Indicates that a cartridge error has occurred in the loaded cartridges.
Not Connect	Indicates that the FC cable is disconnected.

Drive status 2

Initializing	Indicates that the drive is being initialized after power-on.
No Tape	Indicates that no cartridge is loaded.
Loading	Indicates that loading operation is under way.
Ready	Indicates that loading has been completed and that the drive is ready for processing.
Write Protected	Indicates that the loaded cartridges are write protected.
Rewinding	Indicates that cartridges are being rewound.
Reading	Indicates that cartridges are being read.
Writing	Indicates that cartridges are being written to.
Erasing	Indicates that cartridge contents are being deleted.
Locating	Indicates that cartridges are being located.
Unloading	Indicates that the unloading operation is under way.
Unloaded	Indicates that the unloading operation is completed.
Cleaning	Indicates that cleaning operation is under way.
Required Clean	Indicates that insertion of cleaning cartridge is required.
Need Clean	Indicates that insertion of cleaning cartridge is required (Only the cleaning cartridge can be inserted in the Need Clean status).
Error	Indicates that a drive error occurred (The error code is also indicated). Indicates a failure of the cooling fan for the drive.
Media Error	Indicates that the loaded cartridge has an error.
Updating	Indicates that drive firmware is being updated.
No DRV or POFF	Indicates that no drive is installed or the power is off.

5.3 Referencing Library Information

To reference library information, click the [Information] button in the menu frame.

5.3.1 Referencing information about the cartridge in the cell

It is possible to view information about the cartridge in the general cell, CAS magazine cell, and drive. Clicking the [Cell Map] button displayed under [Information] displays the window below.

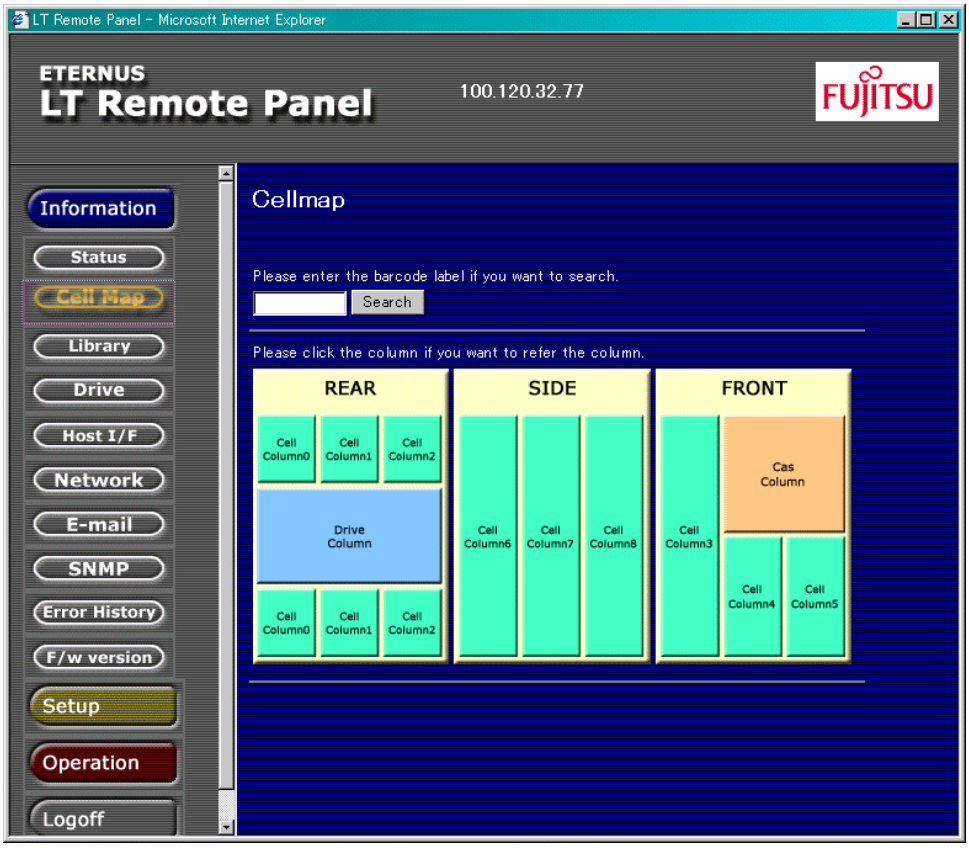


Figure 5.9 Cell map window

5.3.1.1 Referencing the general cell

"Cell Column" in the displayed columns corresponds to the general cells.

Click the Cell Column number to be referenced using the mouse.

The following shows the window displayed when Cell Column2 is clicked:

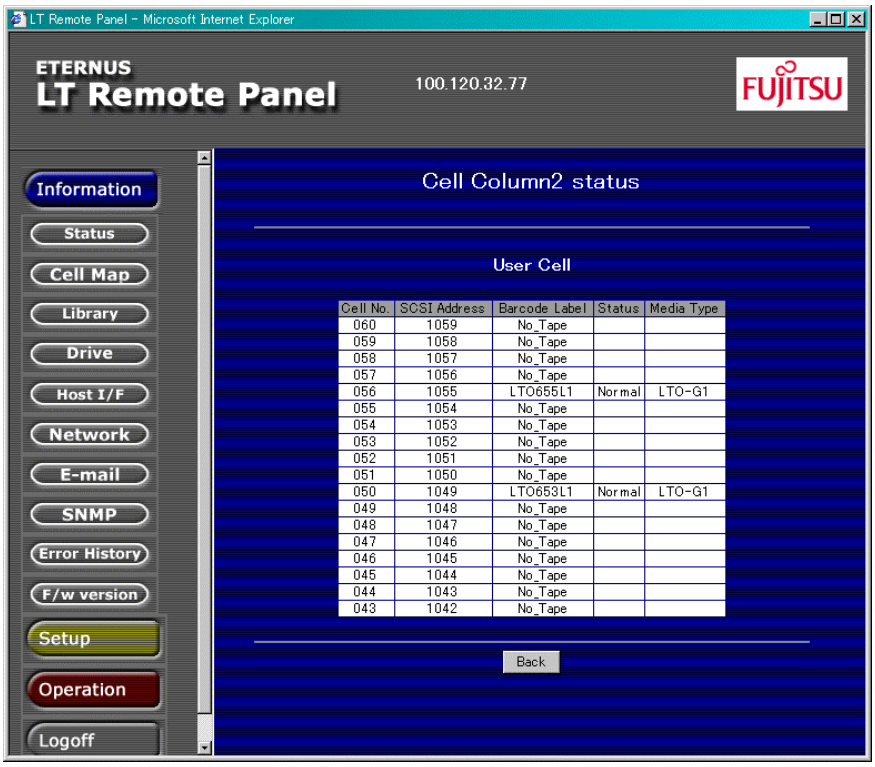


Figure 5.10 General cell cartridge information display window

Display item	Explanation
Cell No.	Indicates a physical address.
SCSI Address	Indicates an address of the element used with SCSI.
Barcode Label	- The bar code label of the cartridge stored in the cell is displayed - If the bar code label cannot be identified or no bar code label is affixed, "No_Label" is displayed. - If there is no cartridge, "No_Tape" is displayed. In such case, "Media type" is not displayed.
Status	See Explanation of status.
Media Type	Indicates the cartridge type. If the cartridge cannot be identified, "Unknown" is displayed.

- Explanation of status

Display item	Explanation
Normal	Indicates that the cartridge is normal.
Forbidden	Indicates that the cartridge is not the one to be stored in the cell.
Cell Error	Indicates that the cell has a failure.
BCR Error	Indicates that a barcode reader failure occurred and that the barcode label might not be read correctly.
Media Error	Indicates a cartridge error.
Unknown Label	Indicates that the barcode label of the cartridge does not meet the standard.
Unusable cell	Indicates that the cell cannot be used because of a CIC sensor error.

The cleaning cartridge/diagnostic cartridge storage cell and reserve cell are installed in Cell Column5 and information about these cells can be referenced. The following table lists the display contents.

- Cleaning cell that stores cleaning cartridge

Display item	Explanation
Cell No.	Indicates a physical address.
Barcode Label	The bar code label of the cartridge stored in the cell is displayed - If the bar code label cannot be identified or no bar code label is affixed, "No_Label" is displayed. - If there is no cartridge, "No_Tape" is displayed. In such case, "Media status" and "Media type" are not displayed.
Count	Left side: Indicates the number of times of using the cleaning cartridge. Right side: Indicates the number of times that the cleaning cartridge can be used.
Media status	Indicates the status of cleaning cartridge. Normal: Indicates that the cartridge can be used. Media Error: Indicates that the cartridge cannot be used due, for example, to a media error. Limit: Indicates that the cartridge cannot be used because the maximum usage count has been reached. For other statues, see Explanation of status.
Media type	Indicates the cartridge type. Normally, LTO-C is displayed. If the type cannot be identified, "Unknown" is displayed.

- Diagnostics cell that stores diagnostic cartridges

Display item	Explanation
Cell No.	Indicates a physical element address.
Barcode Label	The bar code label of the cartridge stored in the cell is displayed - If the bar code label cannot be identified or no bar code label is affixed, "No_Label" is displayed. - If there is no cartridge, "No_Tape" is displayed.
Status	See Explanation of status.
Media type	Indicates the cartridge type. Normally, LTO-C is displayed. If the type cannot be identified, "Unknown" is displayed.

- Reserve cell

Display item	Explanation
Cell No.	Indicates a physical element address.
Barcode Label	The bar code label of the cartridge stored in the cell is displayed - If the bar code label cannot be identified or no bar code label is affixed, "No_Label" is displayed. - If there is no cartridge, "No_Tape" is displayed.
Status	See Explanation of status.
Media type	Indicates the cartridge type. Normally, LTO-C is displayed. If the type cannot be identified, "Unknown" is displayed.

5.3.1.2 Referencing the magazine cell

"Cas CLMumn" in the displayed columns corresponds to the magazine cells.

Click Cas CLMumn to display a window that has the following appearance:

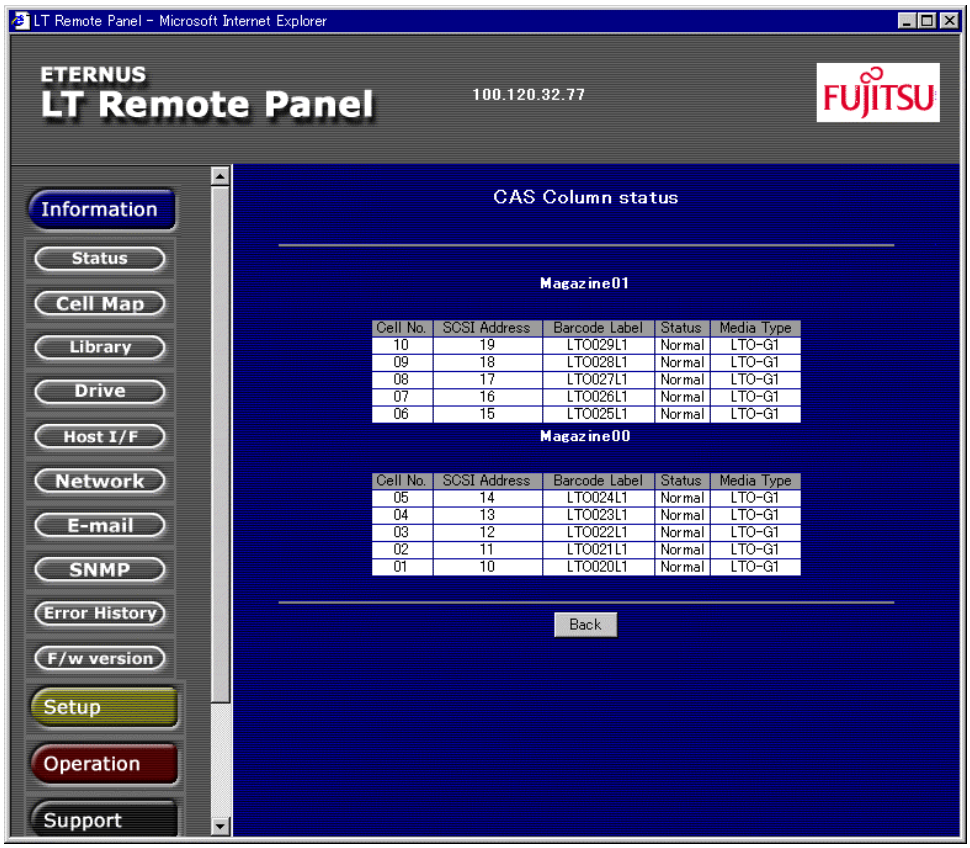

LT Remote Panel - Microsoft Internet Explorer
ETERNUS
LT Remote Panel
100.120.32.77
FUJITSU
Information
Status
Cell Map
Library
Drive
Host I/F
Network
E-mail
SNMP
Error History
F/w version
Setup
Operation
Support
CAS Column status
Magazine01
Cell No. | SCSI Address | Barcode Label | Status | Media Type
10 | 19 | LTO029L1 | Normal | LTO-G1
09 | 18 | LTO028L1 | Normal | LTO-G1
08 | 17 | LTO027L1 | Normal | LTO-G1
07 | 16 | LTO026L1 | Normal | LTO-G1
06 | 15 | LTO025L1 | Normal | LTO-G1
Magazine00
Cell No. | SCSI Address | Barcode Label | Status | Media Type
05 | 14 | LTO024L1 | Normal | LTO-G1
04 | 13 | LTO023L1 | Normal | LTO-G1
03 | 12 | LTO022L1 | Normal | LTO-G1
02 | 11 | LTO021L1 | Normal | LTO-G1
01 | 10 | LTO020L1 | Normal | LTO-G1
Back

Figure 5.11 Magazine cell cartridge information display window

Display item	Explanation
Cell No.	Indicates a physical element address.
SCSI Address	Indicates an address of the element used with SCSI.
Barcode Label	The bar code label of the cartridge stored in the cell is displayed - If the bar code label cannot be identified or no bar code label is affixed, "No_Label" is displayed. - If there is no cartridge in the magazine, "No_Tape" is displayed. In such case, "Media type" is not displayed.
Status	See Explanation of status.
Media Type	Indicates the cartridge type. If the type cannot be identified, "Unknown" is displayed.

Clicking the [Back] button returns the window to the Cell Map window.

5.3.1.3 Referencing the drive cell

"Drive CLMumn" in the displayed columns corresponds to the drive cells.

Click Drive CLMumn to display a window below.

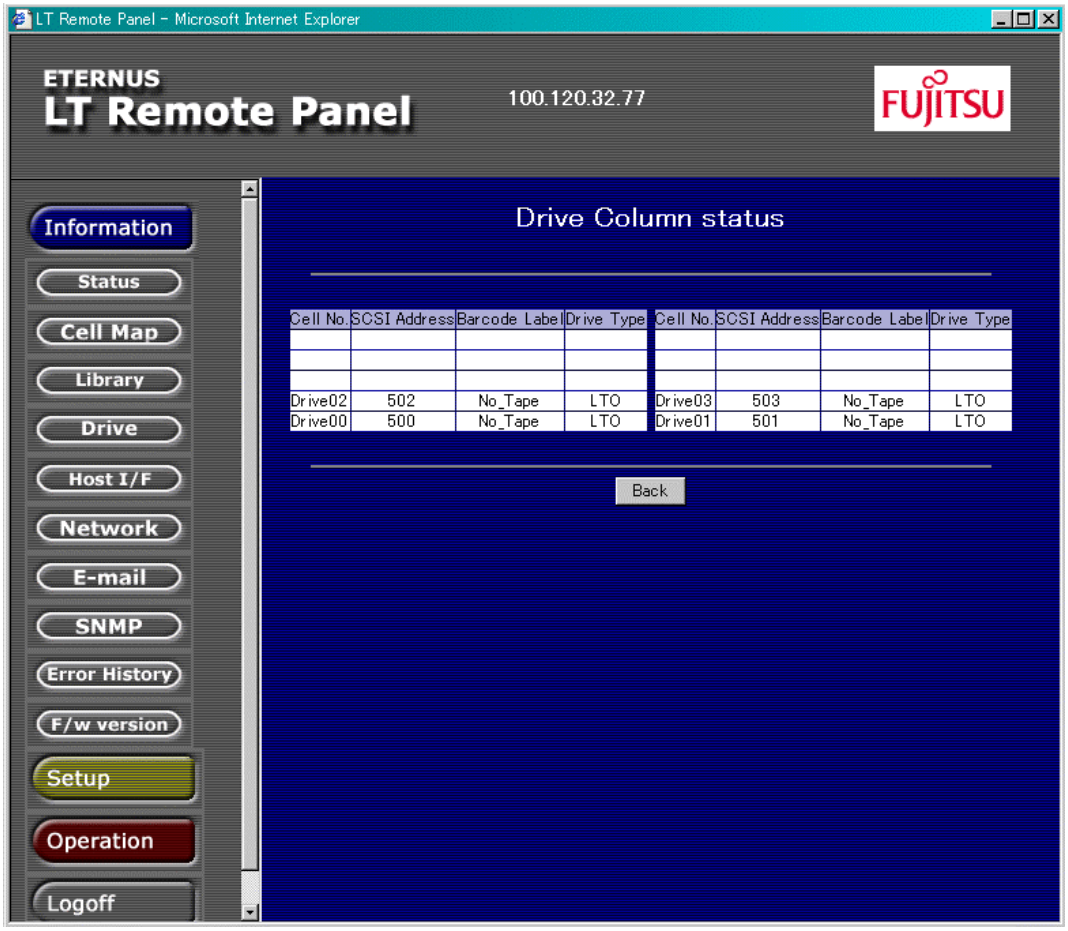


Figure 5.12 Drive cell cartridge information display window

Display item	Explanation
Cell No.	Indicates a physical element address.
SCSI Address	Indicates an address of the element used with SCSI.
Barcode Label	The bar code label of the cartridges stored in the cell is displayed - If the bar code label cannot be identified or no bar code label is affixed, "No_Label" is displayed. - If there is no cartridge in the drive, "No_Tape" is displayed.
Drive Type	Indicates the drive type. If the type cannot be identified, "Unknown" is displayed.

Clicking the [Back] button returns the window to the Cell Map window.

5.3.1.4 Searching using the bar code label

In the input box of the cell map window, enter the bar code label of a cartridge that you want to find and click the [Search] button. The column and cell number indicating where the cartridge is stored is displayed in another window.

To find a cartridge with a bar code label that the library does not recognize, leave the input box blank and click the [Search] button.

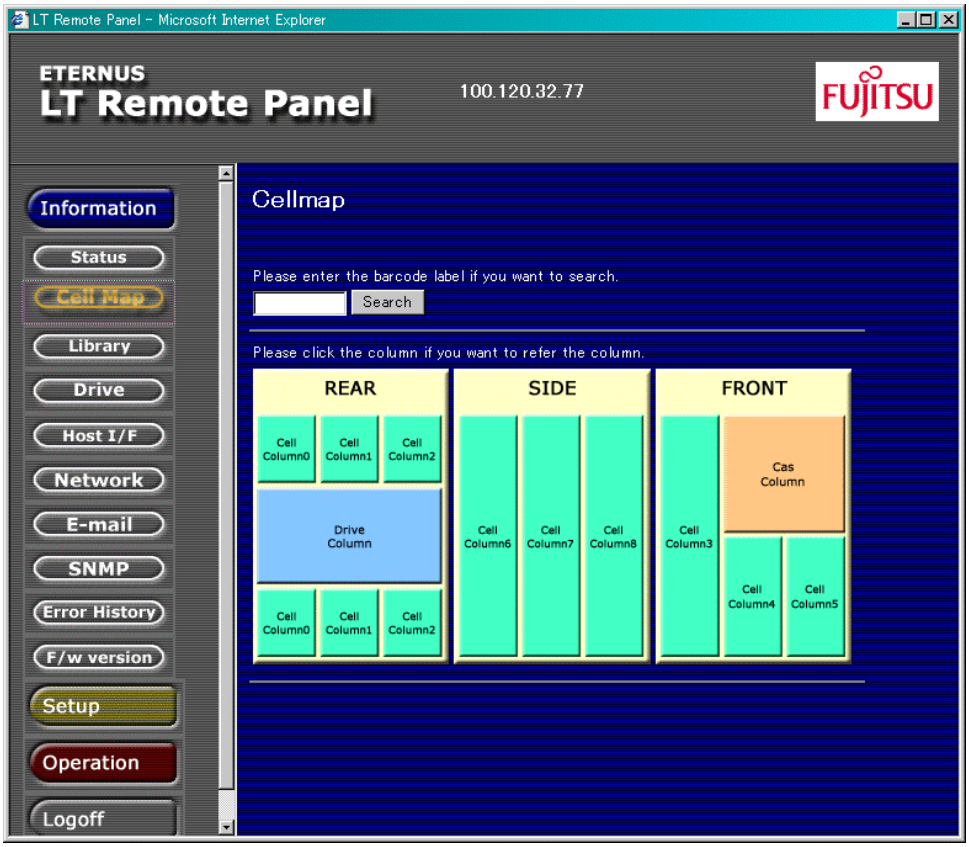


Figure 5.13 Bar code label search window

5.3.2 Referencing setup information for the host interface

By clicking the [Host I/F] button displayed under [Information], setup information for the host interface such as the LOOP ID, adapter WWPN, and host WWPN can be referenced.

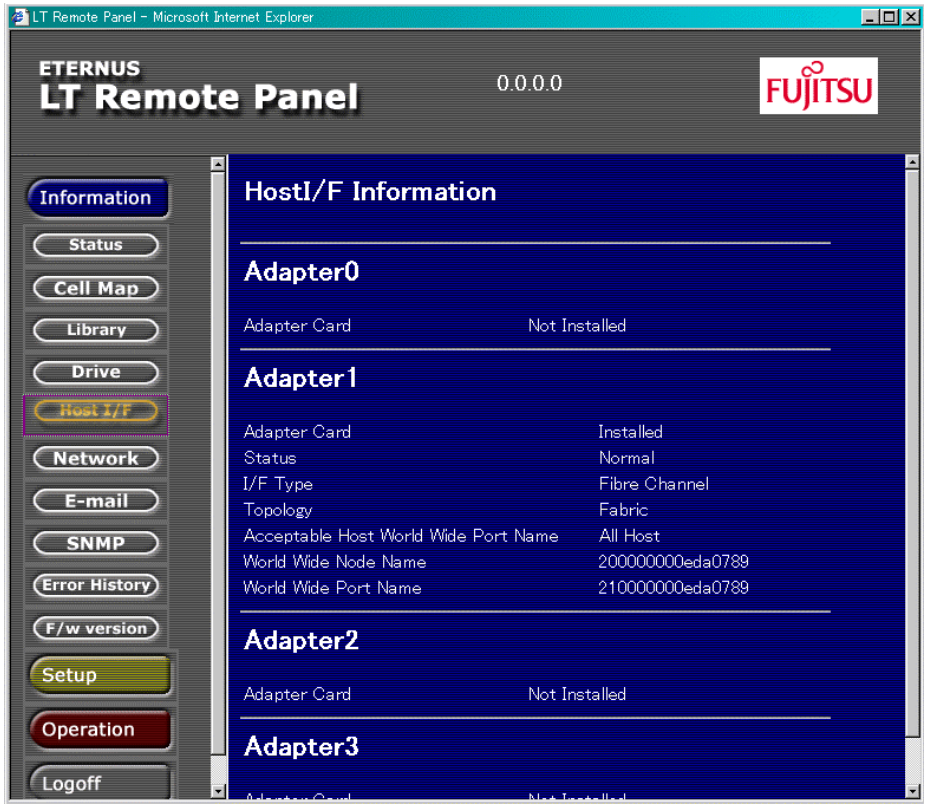


Figure 5.14 Host interface setup information display window

The following information about all adapters is displayed:

Display item	Explanation
Adaptor Card	Indicates the installation status of the host interface: - If installed, "Installed" is displayed. - If not installed, "Not Installed" is displayed.
Status	Indicates the status of host interface: - If operating normally, "Normal" is displayed. - If the FC cable is disconnected, "Not Connect" is displayed. - If an error occurred, "Error" is displayed.
I/F Type	Displays the type of interface.
Topology	Displays the connection form Fablic or FC_AL.
Addressing Mode	Displays the addressing mode (Hard or Soft). (If Topology is FC_AL)
LOOP ID	Indicates LOOP ID (If Addressing Mode is Hard).
Acceptable Host World Wide Port Name	Displays up to eight WWPN of the Host permitted by the host interface. If not set, "All Host" is displayed.
World Wide Node Name	Displays WWNN of the host interface.
World Wide Port Name	Displays WWPN of the host interface.

5.3.3 Referencing setup information for the library

By clicking the [Library] button displayed under [Information], setup information for the library such as the physical library elements (cell/drive/magazine), and the Vendor ID and Product ID can be referenced.

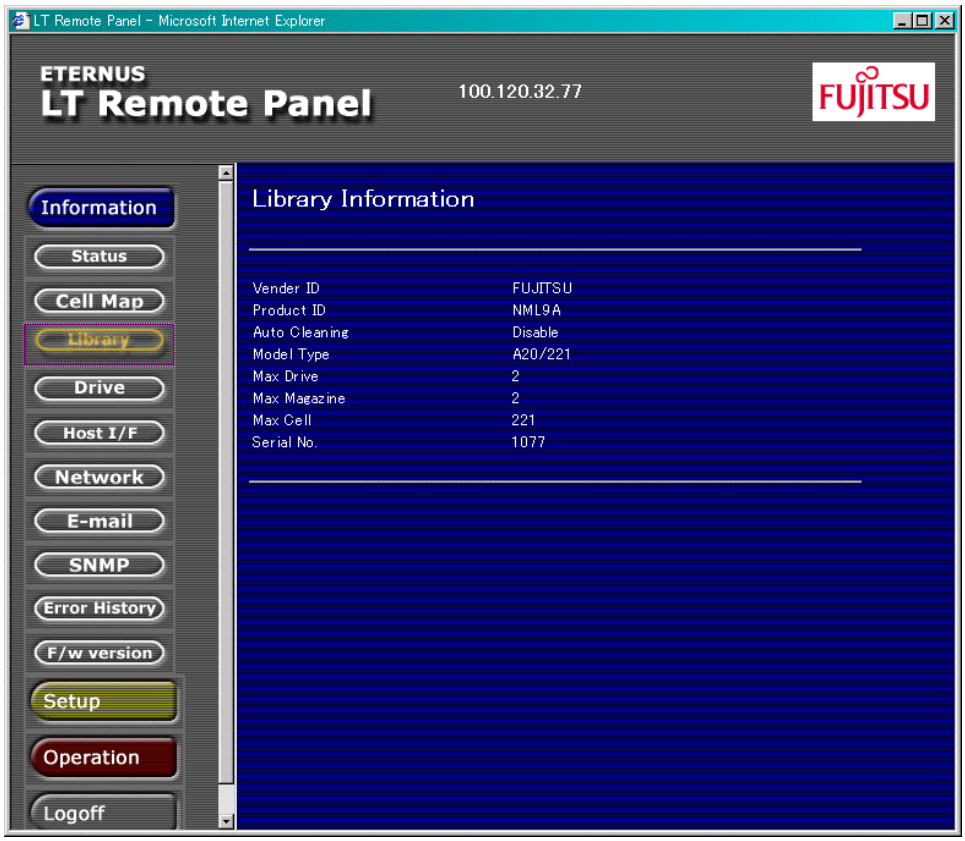


Figure 5.15 Library setup information display window

Display item	Explanation
Vendor ID	Displays the Vendor ID of the library.
Product ID	Displays the Product ID of the library.
Auto Cleaning	Indicates the auto-cleaning function of the drive: - If the auto-cleaning function is enabled, "Enable" is displayed. - If the auto-cleaning function is disabled, "Disable" is displayed.
Model Type	Displays the model type of the library.
Max Drive	Displays the number of installed drives.
Max Magazine	Displays the number of installed magazines.
Max Cell	Displays the number of installed user cells.
Serial No.	Displays the serial number of the library.

5.3.4 Referencing setup information for the drive

By clicking the [Drive] button displayed under [Information], setup information for the drive such as LOOP ID, Vendor ID, Product ID, and WWN can be referenced.

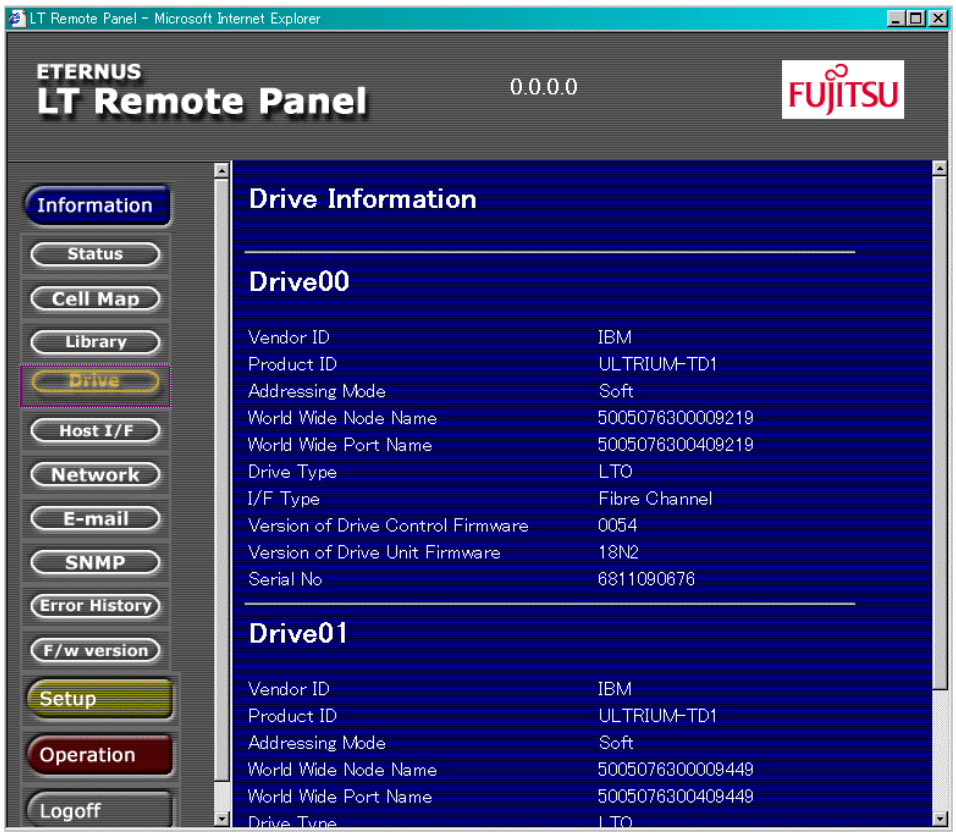


Figure 5.16 Drive setup information display window

The following information about all drives is displayed:

Display item	Explanation
Vendor ID	Displays the Vendor ID of the drive.
Product ID	Displays the Product ID of the drive.
Addressing Mode	Displays the addressing mode (Hard or Soft).
LOOP ID	Indicates LOOP ID (If Addressing Mode is Hard).
World Wide Node Name	Displays the WWNN of the drive.
World Wide Port Name	Displays the WWPN of the drive.
Drive Type	Displays the drive type.
I/F Type	Displays the interface type.
Drive Control Firmware	Displays the Drive Control firmware version number.
Drive Unit Firmware	Displays the Drive Unit firmware version number.
Serial No.	Displays the serial number of the drive.

5.3.5 Referencing setup information for the network

By clicking the [Network] button displayed under [Information], setup information for the network such as the IP address, subnet mask, gateway, and MAC address can be referenced.

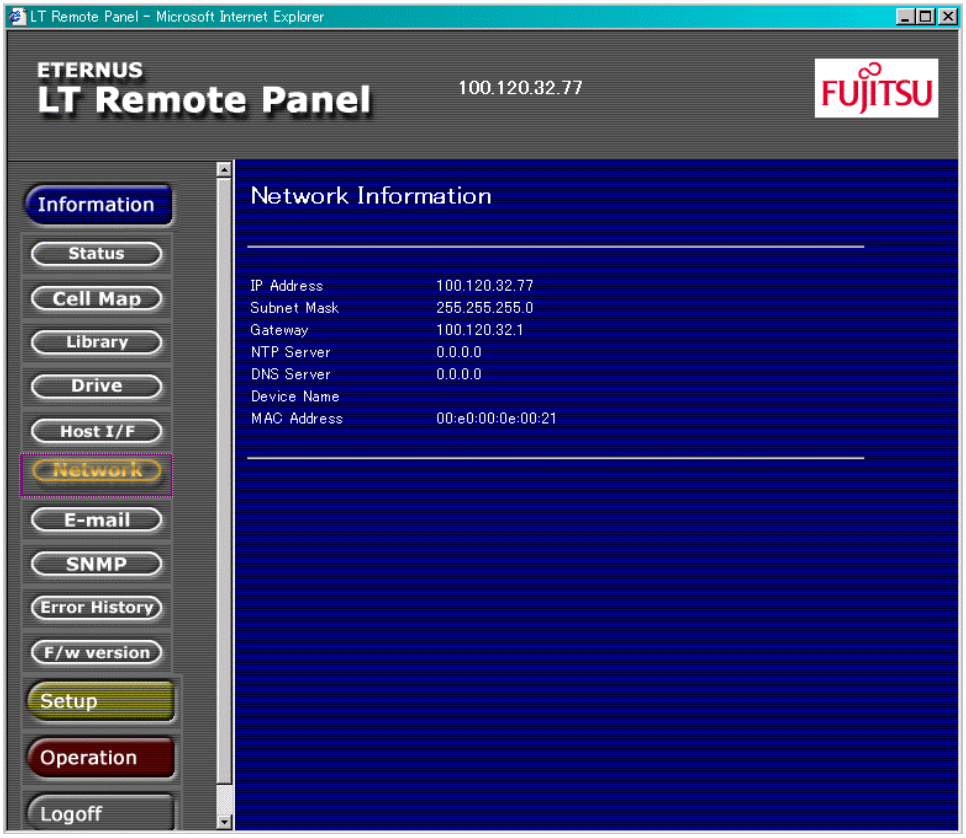


Figure 5.17 Network setup information display window

Display item	Explanation
IP Address	Displays an IP address.
Subnet Mask	Displays a subnet mask address.
Gateway	Displays a gateway address.
NTP Server	Displays an NTP server address.
DNS Server	Displays a DNS server address.
Device Name	Displays a unique library device name. The value set in the network settings is displayed.
MAC Address	Displays a MAC address.

5.3.6 Referencing error history information

By clicking the [Error History] button displayed under [Information], history of hardware errors of the library/drive that occurred in the past can be referenced. By clicking the [More] button, additional information can be referenced (The latest 10 pieces of information are displayed. Entry 1 indicates the latest error.).

If no error history is registered, "No entries in library/drive history" is displayed.

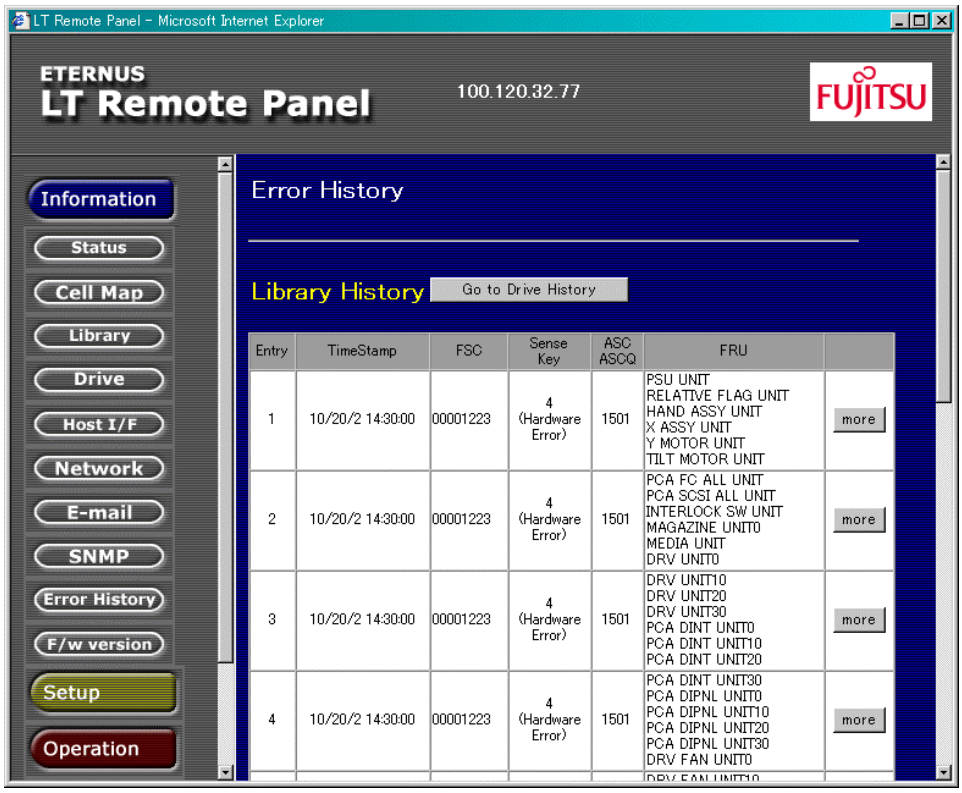


Figure 5.18 Error history display window

Display item	Explanation
Library Error History	Displays the error history of the library.
Drive Error History	Displays the error history of the drive.
Timestamp	Displays a time at which an error occurred.
FSC	Displays the detailed error code.
Sense Key	Displays the sense key of SCSI.
ASC/ASCQ	Displays ASC/ASCQ of SCSI.
FRU	Displays the name of unit in which an error occurred.
Host ID	Displays LOOP ID of the host in which an error occurred.
Target ID	Displays the LOOP ID of the library where an error occurred.
Command Code	Displays the SCSI command code in which an error occurred.

Display item	Explanation
Logical Unit Number	Displays the Logical Unit Number of the library in which an error occurred.
Source Address	Displays the source address if an error occurred when cartridge transfer is requested from SCSI.
Destination Address	Displays the destination address if an error occurred when cartridge transfer is requested from SCSI.
Exchange Address	Displays the cell address for replacement when cartridge replacement is requested from SCSI.
Barcode Label	Displays the bar code label of cartridges used.

5.3.7 Referencing the firmware version number

The version number of the library firmware and drive firmware can be referenced.

By clicking the [F/w version] button displayed under [Information], the firmware version number can be referenced.

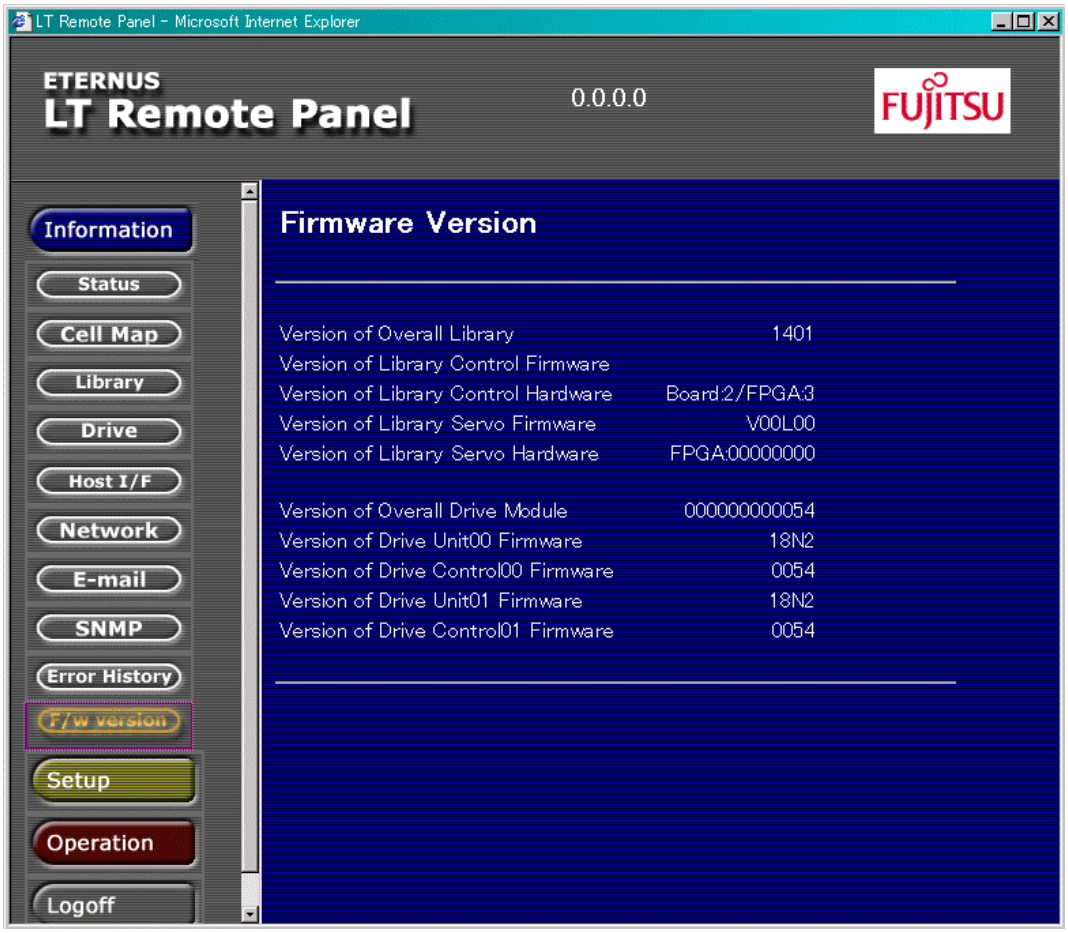


Figure 5.19 Firmware version number display window

Display item	Explanation
Overall Library	Displays the total version number of library firmware.
Library Control Firmware	Displays the version number of library firmware.
Library Control Hardware	Displays the version number of library hardware.
Library Servo Firmware	Displays the version number of Servo firmware.
Library Servo Hardware	Displays the version number of Servo hardware.
Overall Drive Module	Displays the total version number of drive firmware.
Drive UnitXX	Displays the firmware version number of each installed

Display item	Explanation
Firmware	drive unit.
Drive ControlXX Firmware	Displays the firmware version number of each installed drive controller.

5.3.8 Referencing setup information for e-mail

By clicking the [E-mail] button displayed under [Information], setup information for e-mail such as the source e-mail address, destination e-mail address, and SMTP server address can be referenced.

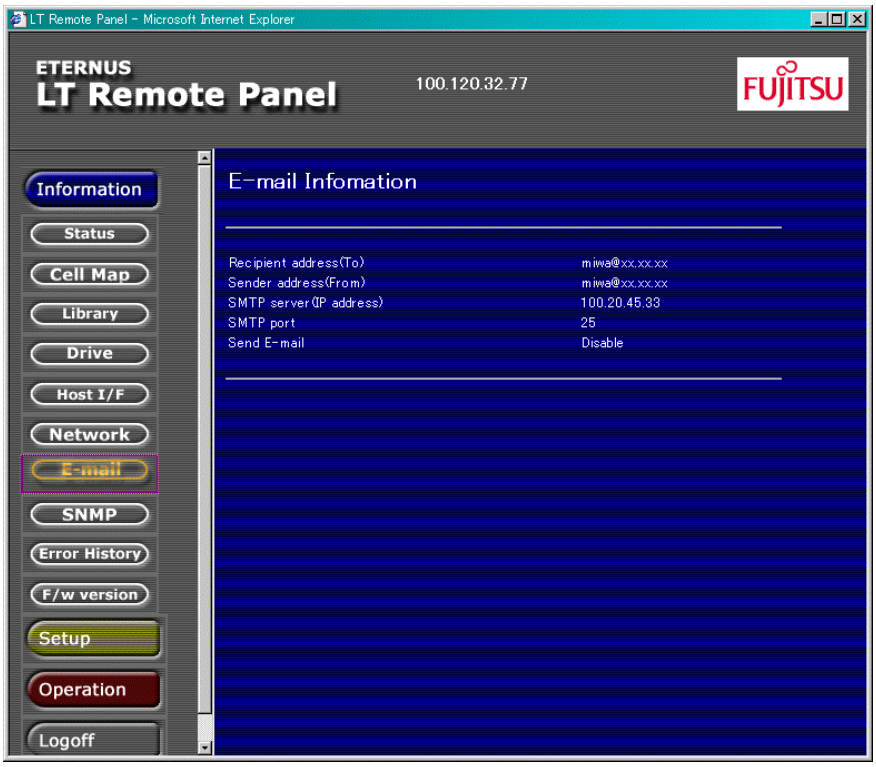


Figure 5.20 E-mail setup information display window

Display item	Explanation
Recipient address (To)	Displays destination addresses (up to five addresses).
Sender address (From)	Displays the source address.
SMTP server (IP address)	Displays the IP address of the SMTP server.
SMTP port	Displays the port number of the SMTP server.
Send Email	Displays whether to send e-mail. Enable: Send e-mail. Disable: Do not send e-mail.

The following shows an example of mail contents to be sent when a library error occurs.

*** The Library error occurred. ***	
Timestamp : 2002/1/1 12:00:00	Indicates the time at which an error occurred.
IP Address : 121.25.23.117	Indicates the IP address (The device name is displayed if it is set.).
FSC : 20001001	Indicates the Fault Symptom Code.
FRU : PCA LCNT UNIT	Indicates the replacement parts.
Sense Key : 04	Indicates the Sense key.
ASC/ASCQ : 4400	Indicates ASC/ASCQ.
Barcode Label : LTO281L1	Indicates the bar code label used when an error occurred.
Host ID : 01	Indicates LOOP ID of the host or switch.
Target ID : 125	Indicates LOOP ID of the library.
Logical Unit Number : 00	Indicates the Logical Unit number of the library.
Command code : 01	Indicates the SCSI command when an error occurred.
Source Address : 1000	Indicates the source cell address.
Destination Address : 500	Indicates the destination cell address.
Library Serial Number : XZ000001	Indicates the serial number of the library.
Version of Overall Library : 00-01	Indicates the total version number of the controller.
Version of Library Control Firmware : R0_1_0-020426	Indicates the firmware version number of the controller.
Version of Library Control Hardware : Board:2/FPGA:3	Indicates the hardware version number of the controller.
Version of Library Servo Firmware : V01L05	Indicates the firmware version number of the servo unit.
Version of Library Servo Hardware : Board:0/FPGA:2	Indicates the hardware version number of the servo unit.
Version of Overall Drive Module : 000000000260	Indicates the total version number of the drive module.
Version of Drive Unit00 Firmware : 18N2	Indicates the firmware version number of the drive unit 0.
Version of Drive Control Unit00 Firmware : 0056	Indicates the firmware version number of the drive controller 0.
Version of Drive Unit01 Firmware : 18N2	Indicates the firmware version number of the drive unit 1.
Version of Drive Control Unit01 Firmware : 0056	Indicates the firmware version number of the drive controller 1.

The following shows an example of mail contents to be sent when a drive error occurs.

*** The drive error occurred. ***	
Timestamp : 2002/1/1 12:00:00	Indicates the time at which an error occurred.
IP Address : 121.25.23.117	Indicates the IP address (The device name is displayed if it is set.).
FSC : 48001001	Indicates the Fault Symptom Code.
FRU : DRV UNIT0	Indicates the replacement parts.
Sense Key : 04	Indicates the Sense key.
ASC/ASCQ : 4400	Indicates ASC/ASCQ.
Barcode Label : LTO281L1	Indicates the bar code label used when an error occurred.
Library Serial Number : XZ000001	Indicates the serial number of the library.
Version of Overall Library : 00-01	Indicates the total version number of the controller.
Version of Library Control Firmware : R0_1_0-020426	Indicates the firmware version number of the controller.
Version of Library Control Hardware : Board:2/FPGA:3	Indicates the hardware version number of the controller.
Version of Library Servo Firmware : V01L05	Indicates the firmware version number of the servo unit.
Version of Library Servo Hardware : Board:0/FPGA:2	Indicates the hardware version number of the servo unit.
Version of Overall Drive Module : 000000000260	Indicates the total version number of the drive module.
Version of Drive Unit00 Firmware : 18N2	Indicates the firmware version number of the drive unit 0.
Version of Drive Control Unit00 Firmware : 0056	Indicates the firmware version number of the drive controller 0.
Version of Drive Unit01 Firmware : 18N2	Indicates the firmware version number of the drive unit 1.
Version of Drive Control Unit01 Firmware : 0056	Indicates the firmware version number of the drive controller 1.

5.3.9 Referencing setup information for SNMP

Click the [SNMP] button displayed under [Information] to reference setup information for community, the trap destination address, and the send trap function. The following window is displayed.

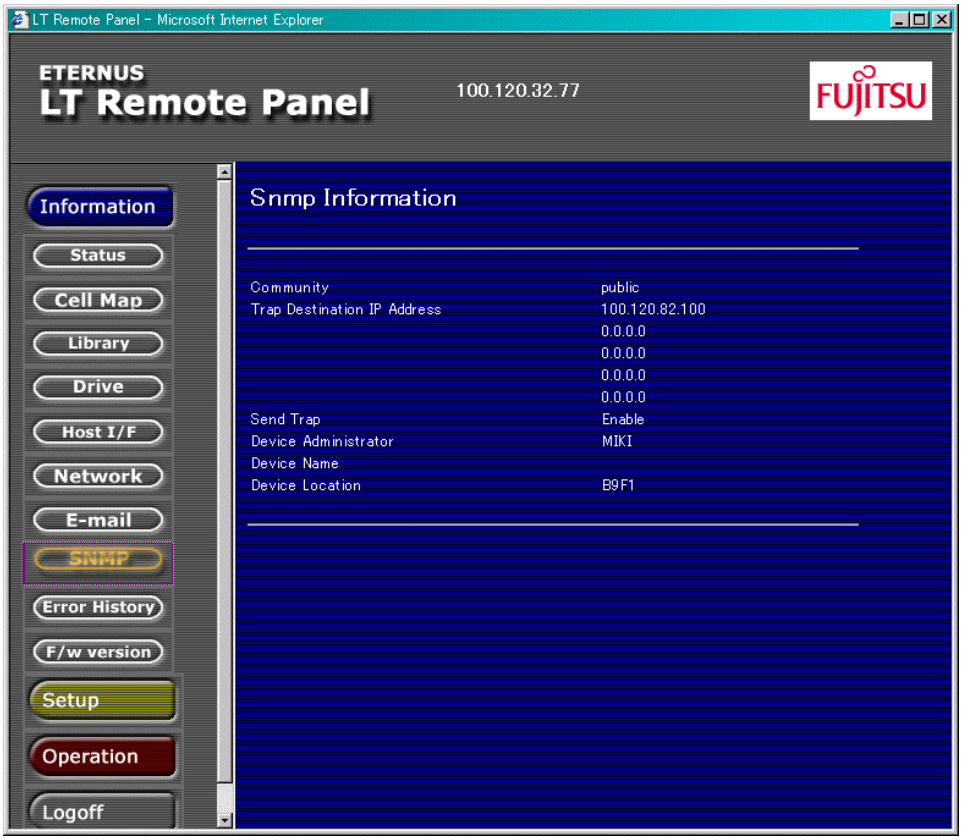


Figure 5.21 SNMP setup information display window

Display item	Explanation
Community	Displays communities (up to five communities).
Trap Destination Address	Displays Trap destination IP addresses (up to five destination addresses)
Send Trap	Displays whether to send Trap. Enable: Send trap. Disable: Do not send Trap.
Device Administrator	Displays the administrator name of device.
Device Name	Displays the device name.
Device locate	Displays device installation location.

5.4 Setting Target ID of the Drive

This section explains the settings for interface when connecting a drive to the host.

1) Click the [Drive] button displayed under [Setup] in the menu frame. A window for drive settings will be displayed.

   If the drive settings are already made, its values are displayed.

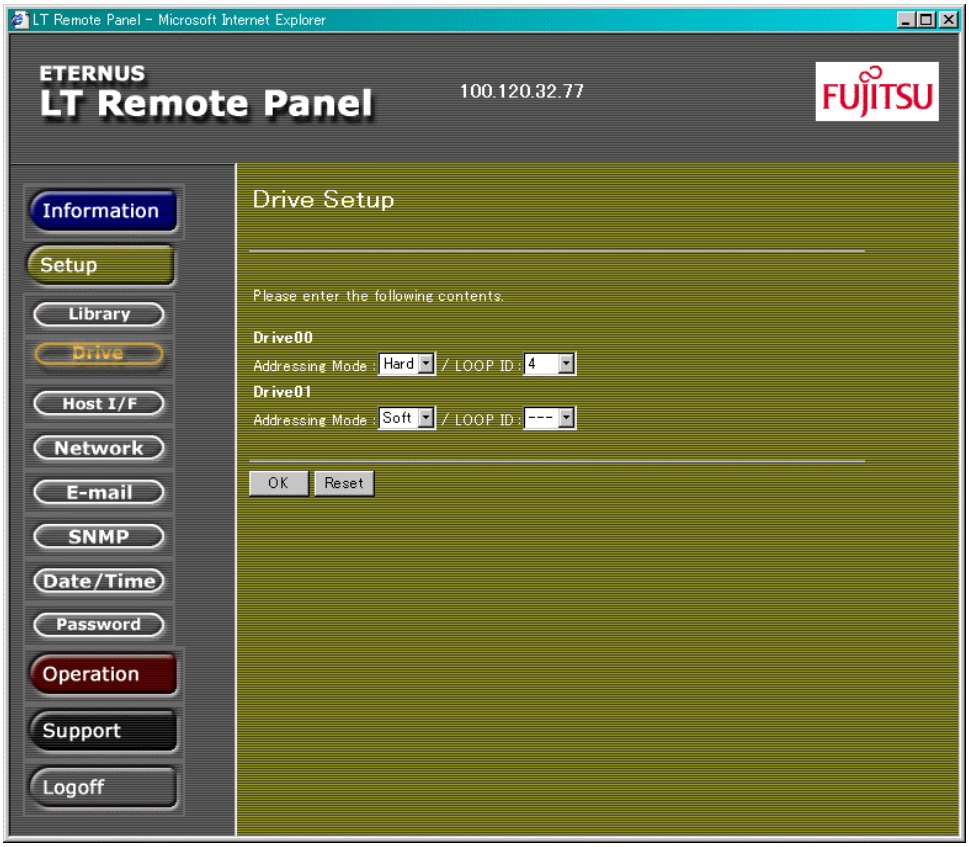


Figure 5.22 Drive setup window

Remarks:

1. If there are cartridges in the drives and there is no drive that can be set, the message "There is no drive that can be set." is displayed.
2. Only drives that can be set are displayed in the window. For drives that cannot be set, the current value is displayed.

2) Set the addressing mode of each drive as either "Hard" or "Soft." If "Hard" is selected, LOOP ID becomes selectable; in such case, select a LOOP ID.

3) Click the [OK] button after all settings are completed. To restore the conditions before the settings, click the [Reset] button.

4) After clicking the [OK] button, the system displays a confirmation window showing the input contents. Click the [OK] button if it is OK to proceed. To make entries again, click the [Back] button.

5) If processing is completed, the system displays a window showing the processing results. This completes the settings.

5.5 Setting Library Information

5.5.1 Setting information about the host interface

The following explains the settings for the interface Target ID and security for connecting the library device to the host.

1) Click the [Host I/F] button displayed under [Setup] in the menu frame. A window for selecting the adapter will be displayed.

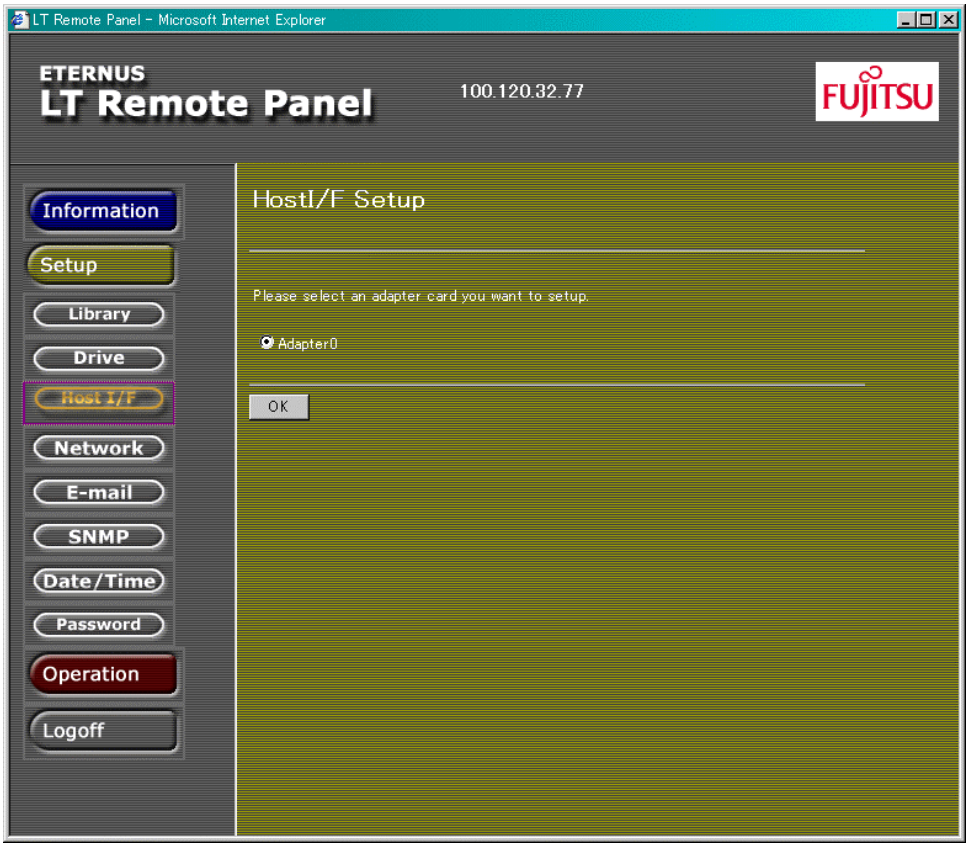


Figure 5.23 Adapter selection window

Select the adapter to be set and then click the [OK] button.

Remarks:

1. If there is no adapter that can be set due, for example, to adapter errors, the message "There is no adapter that can be set" is displayed.
2. Only adapters that can be set are displayed in the window.

2) A setting window for the selected adapter is displayed. From this window, settings for the addressing mode, LOOP ID, and security can be made.

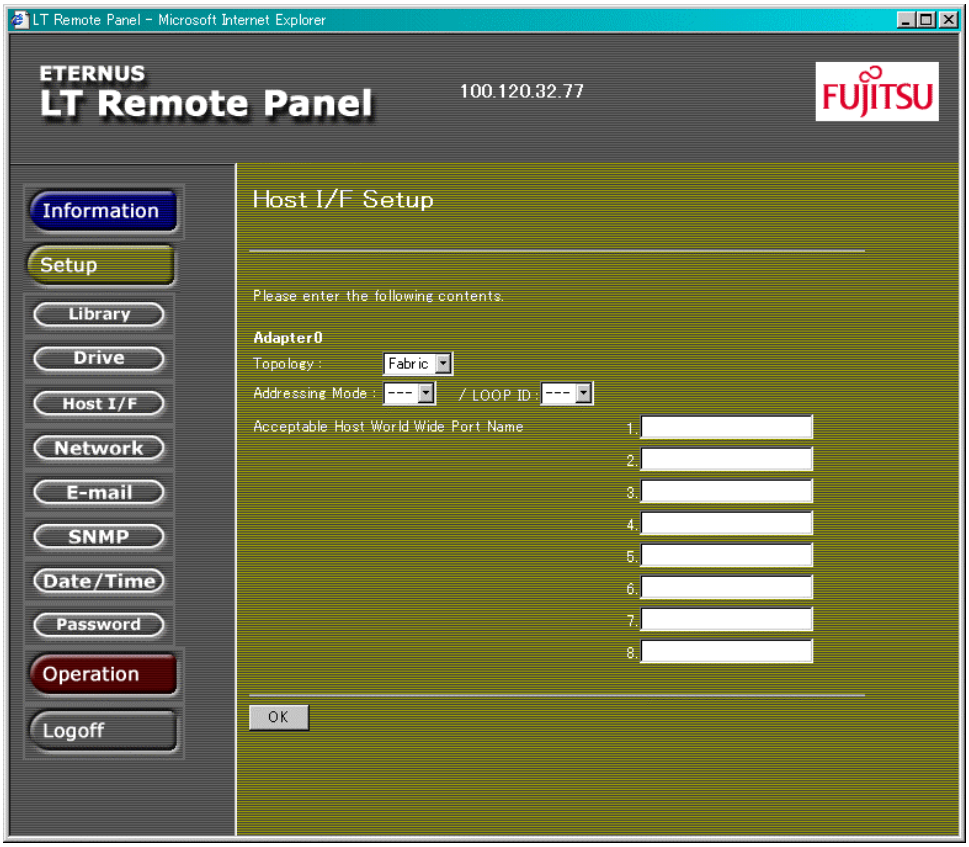


Figure 5.24 Host interface setting window

3) Make settings for each item.

   - Topology: Select from "Fablic" or "FC_AL".
   - Addressing Mode: This item is enabled if FC_AL is selected in Topology. Select from "Hard" and "Soft."
   - LOOP ID: This item needs to be specified if "Hard" is set as the Addressing Mode.
   - Acceptable Host World Wide Port Name: Enter the WWPN of the host that is permitted to access the setup adapter. Up to eight port names can be entered. In one text area, up to 16 characters can be entered. Only en-size alphanumeric characters can be entered. If any character other than alphanumeric characters is entered, an input error message is displayed.

4) Click the [OK] button after all settings are completed. To restore the conditions before the settings, click the [Reset] button.

5) After clicking the [OK] button, the system displays a confirmation window showing the input contents. Click the [OK] button if it is OK to proceed. To make entries again, click the [Back] button.

6) If processing is completed, the system displays a window showing the processing results. To continue settings of the host interface, repeat the above procedure starting with 1).

7) The values that have been set are enabled after settings are completed and the device is restarted.

5.5.2 Setting library information

From the library information setting window, the auto cleaning mode can be set.

1) To set the library information, click the [Library] button displayed under [Setup] in the menu frame. The library setting window will be displayed.

   If the library settings are already made, its values are displayed.

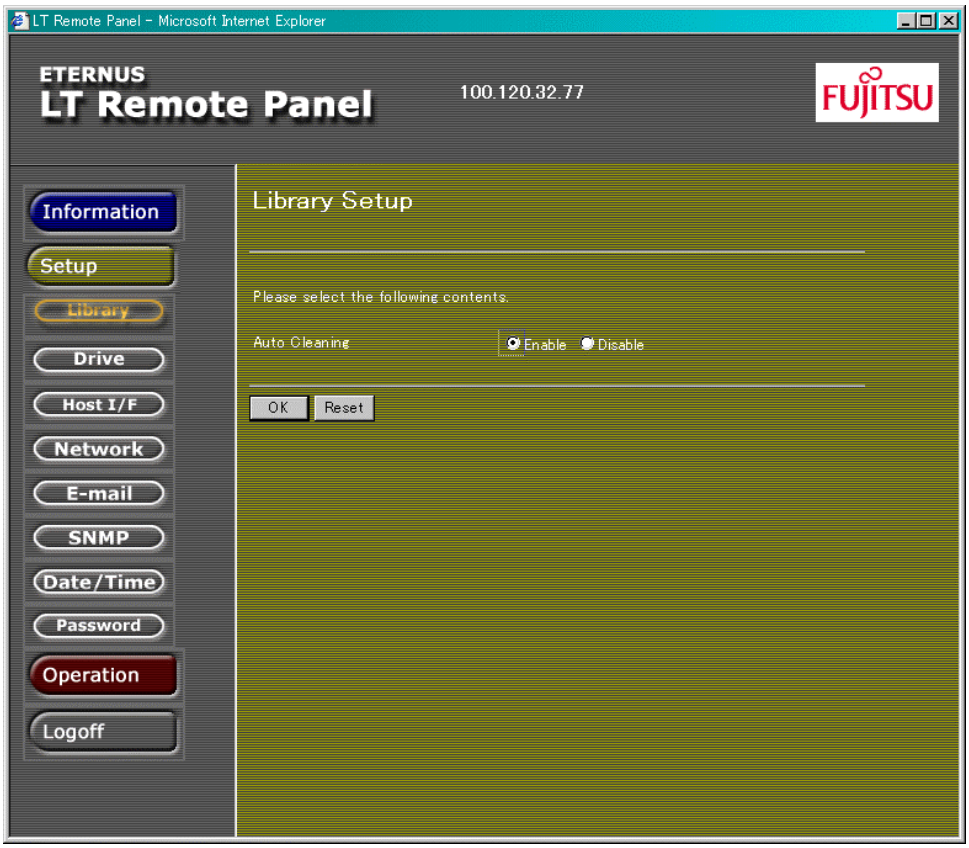


Figure 5.25 Library information setting window

2) Set the item of "Auto Cleaning."

   - Enable: Perform auto cleaning.
   - Disable: Do not perform auto cleaning.

3) Click the [OK] button after all settings are completed. To restore the conditions before the settings, click the [Reset] button.

4) After clicking the [OK] button, the system displays a confirmation window showing the input contents.

   Click the [OK] button if it is OK to proceed. To make entries again, click the [Back] button.

5) A window displaying the processing results is displayed. This completes the settings.

5.5.3 Setting information about the network

The following explains how to set network information.

From the network information setting window, the IP address, subnet mask, gateway, and device name can be set.

1) Click the [Network] button displayed under [Setup] in the menu frame. The network setting window will be displayed.

   If the network settings are already made, its values are displayed.

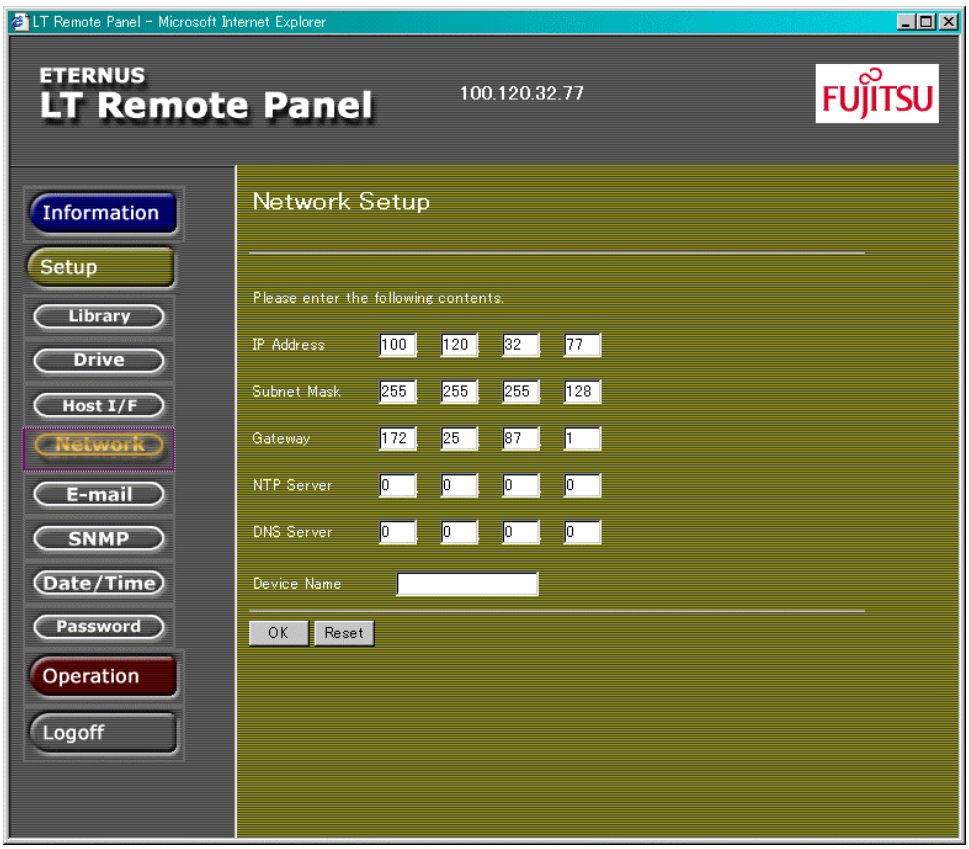


Figure 5.26 Network information setting window

2) Set each of the following items:

- IP Address <required>: Enter the IP address of this library. Only en-size numeric characters can be entered.
- Subnet Mask <required>: Enter the subnet mask of this library. Only en-size numeric characters can be entered.
- Gateway: This item needs to be set if accessed from outside SUB-LAN or accessed from the browser via a proxy server inside SUB-LAN. Only en-size numeric characters can be entered.
- NTP Server: Enter the IP address of the NTP server required to set the clock from the NTP Server. Only en-size numeric characters can be entered.
- DNS Server: Enter the IP address of the DNS server required for remote support. Only en-size numeric characters can be entered.
- Device Name: Enter a unique device name to represent on the browser.

  If not set, the IP address is displayed. Though normally displayed in white, the color changes to red when an error occurs in the library. Up to 20 characters can be entered in the text area. Characters that can be entered are en-size alphanumeric characters, blank characters, and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_`{|}).

Remarks:

1. If a character that is not allowed or an out-of-range value is entered, an input error message is displayed.
2. To enable the settings of the IP address, subnet mask, gateway, NTP server, and DNS server, the library device needs to be restarted.

5.5.4 Setting the clock

The following explains how to set the date and time for the library device.

1) Click the [Date/Time] button displayed under [Setup] in the menu frame to display the date/time setting window.

   If the date/time are already set, their values are displayed.

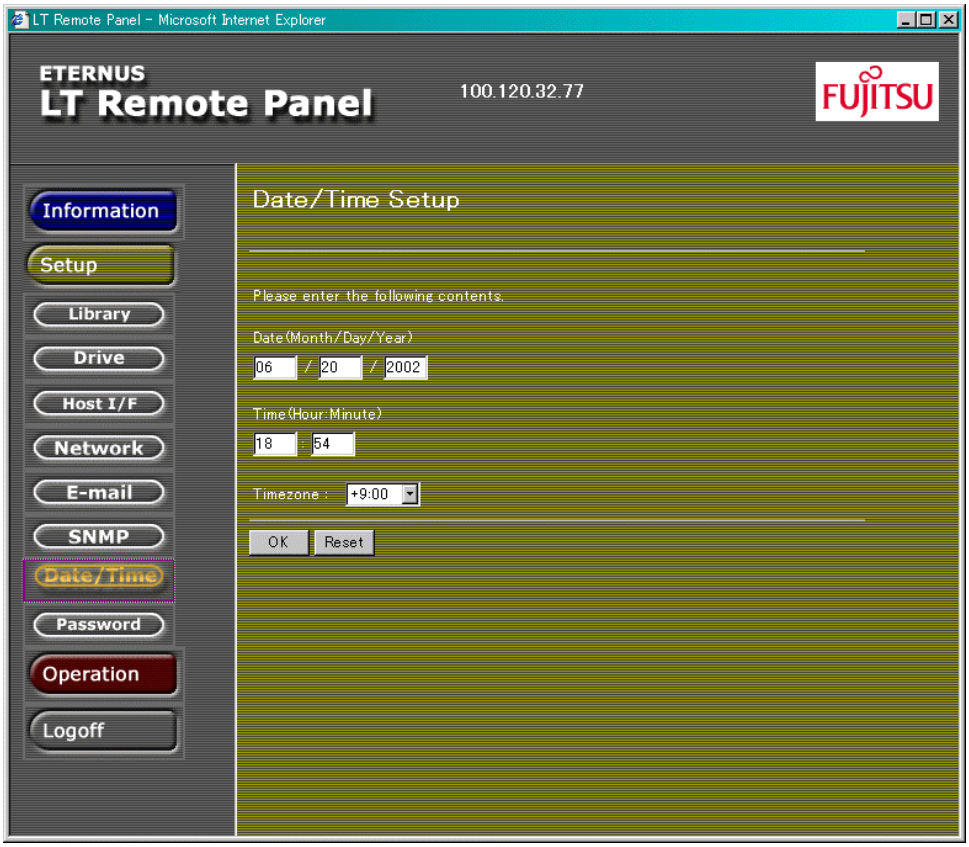


Figure 5.27 Date/time setting window

2) Set each item:

- Date (Month/Day/Year) <required>: Only en-size numeric characters can be entered. The allowed range of input: Month (1-12)/Day (1-31)/Year (2002-2037).
- Time (Hour/Minute) <required>: Only en-size numeric characters can be entered. The allowed range of input: Hour (0-23)/Minute (0-59).

Remarks:

1. If a character that is not allowed or an out-of-range value is entered, an input error message is displayed.
2. For information on the Timezone setting, see Table 4.5, "World time zones."

3) Click the [OK] button after all settings are completed. To restore the conditions before the settings, click the [Reset] button.

4) After clicking the [OK] button, the system displays a confirmation window showing the input contents. Click the [OK] button if it is OK to proceed. To make entries again, click the [Back] button.

5) If processing is completed, the system displays a window showing the processing results. This completes the settings.

5.5.5 Setting the e-mail function

The following explains how to set the e-mail function. This function makes it possible to receive from the device e-mail notification about errors. To use the e-mail function, it is necessary to set the source e-mail address, destination e-mail address, and SMTP server address.

1) Click the [E-mail] button displayed under [Setup] in the menu frame to display the e-mail setting window.

   If the e-mail function is already set, its values are displayed.

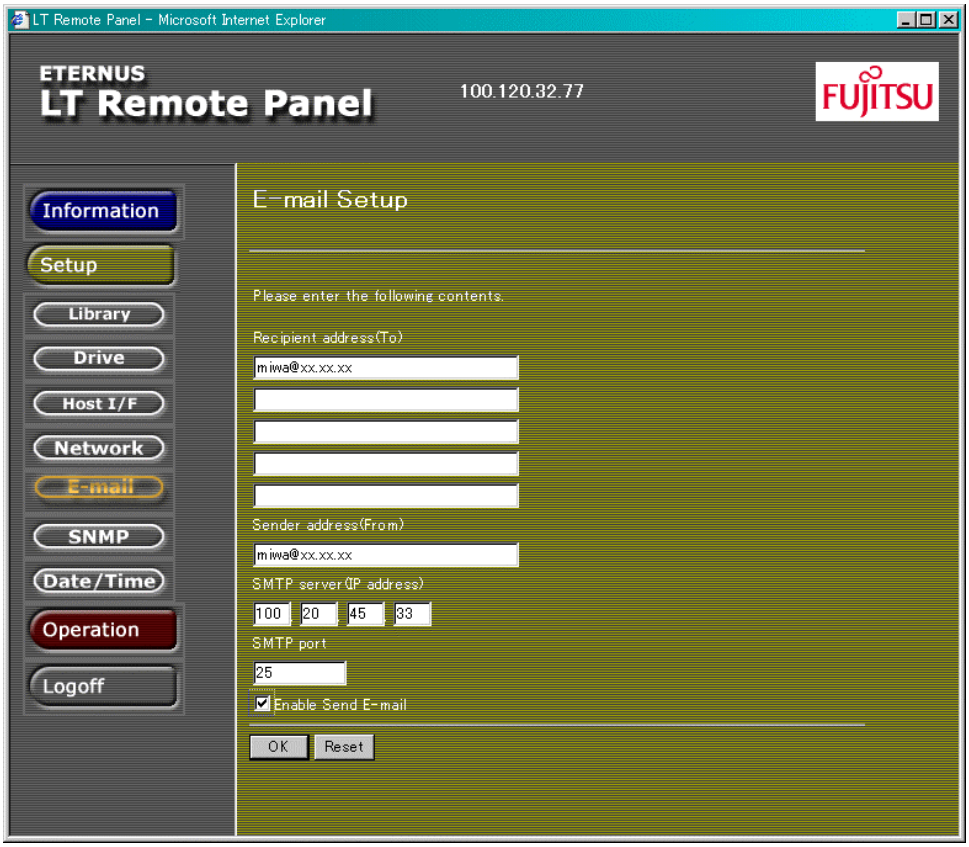


Figure 5.28 E-mail function setting window

2) Set each item:

Display item	Explanation
Recipient Address (To)	Up to 5 mail addresses from which notification should be received can be registered. Up to 64 characters can be entered in the text area. Characters that can be entered are en-size alphanumeric characters and en-size symbols (- _ . @). To remove a mail address already set from the Destination Address, delete the relevant mail address.
Sender address (From)	Set as the source mail address an address registered in the IP address of the SMTP server to be set in the next item. Up to 64 characters can be entered in the text area. Characters that can be entered are en-size alphanumeric characters and en-size symbols (- _ . @).
SMTP server (IP address)	Set the IP address of the SMTP server used for sending mail. Only en-size numeric characters ranging from 0 to 255 can be entered in one text area.
SMTP Port	Set the port of the mail server used to send mail (normally 25). Up to five characters can be entered in a text area. Only en-size numeric characters ranging from 1 to 65535 can be entered in one text area.
Enable Send E-mail	Specify whether to send e-mail to the address specified above if an error occurs. Select this item to enable sending. Clear this item to disable sending.

Remarks:

If any character that is not allowed is entered, an input error message is displayed.

3) Click the [OK] button after all settings are completed.

4) The system displays a window showing the selection contents. Click the [OK] button if it is OK to proceed. To make entries again, click the [Back] button.

5) If processing is completed, the system displays a window showing the processing results. This completes the settings.

5.5.6 Setting the SNMP agent

The following explains how to set the SNMP agent required for communication with the SNMP manager.

1) Click the [SNMP] button displayed under [Setup]. The following window will be displayed.

   If the SNMP agent is already set, its values are displayed.

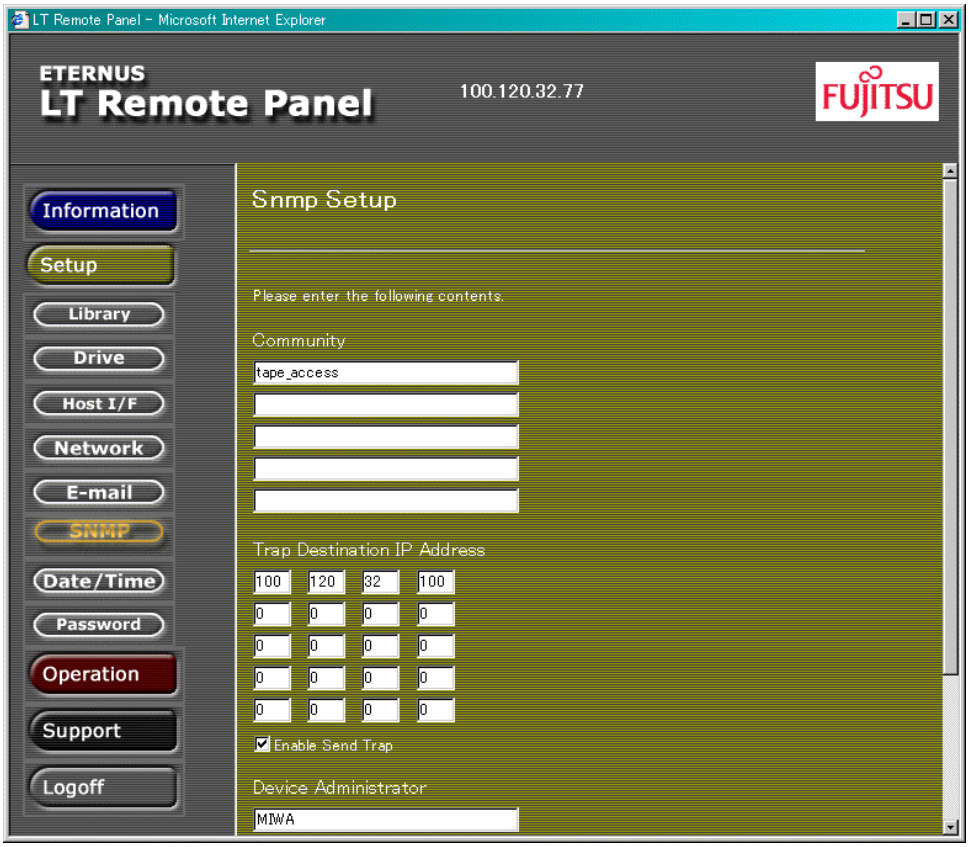


Figure 5.29 SNMP agent setting window

2) Set each item.

Display item	Explanation
Community	Up to five communities set by the SNMP manager can be registered. Though up to 64 characters can be entered in each text area, only one community can be set in one text area. Characters that can be entered are en-size alphanumeric characters and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_`{|}). To remove a setup community already set, delete the relevant community.
Trap Destination IP Address	Traps will be sent to the IP address specified here. Only en-size numeric characters ranging from 0 to 255 can be entered in each text area of this item.
Enable Send Trap	If checked, Traps will be sent to the IP address specified

Display item	Explanation
	in the Trap Destination IP Address.
Device Administrator	Enter the administrator name of this library. Up to 20 characters can be entered in the text area. Characters that can be entered are en-size alphanumeric characters and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_`{|}). Information entered here is reported in SysContact of the MIB information.
Device Name	Enter a unique library device name. Up to 20 characters can be entered in the text area. Characters that can be entered are en-size alphanumeric characters and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_`{|}). Information entered here is reported in SysContact of the MIB information.
Device Location	Enter the installation location of the library device. Up to 20 characters can be entered in the text area. Characters that can be entered are en-size alphanumeric characters and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_`{|}). Information entered here is reported in SysLocation of the MIB information.

Remarks:

If any character that is not allowed is entered, an input error message is displayed.

3) Click the [OK] button after all settings are completed.
4) The system displays a confirmation window showing the input contents. Click the [OK] button if it is OK to proceed. To make entries again, click the [Back] button.
5) If settings are finished, the system displays a window showing the processing results.
6) If settings are finished successfully, a window to ask whether to restart the SNMP agent is displayed (Values that have been set are enabled only after restarting the SNMP agent.).

5.5.7 Changing the password

This section explains how to change the password used to log in to the remote panel.

1) Click the [Password] button displayed under [Setup]. The following window is displayed.

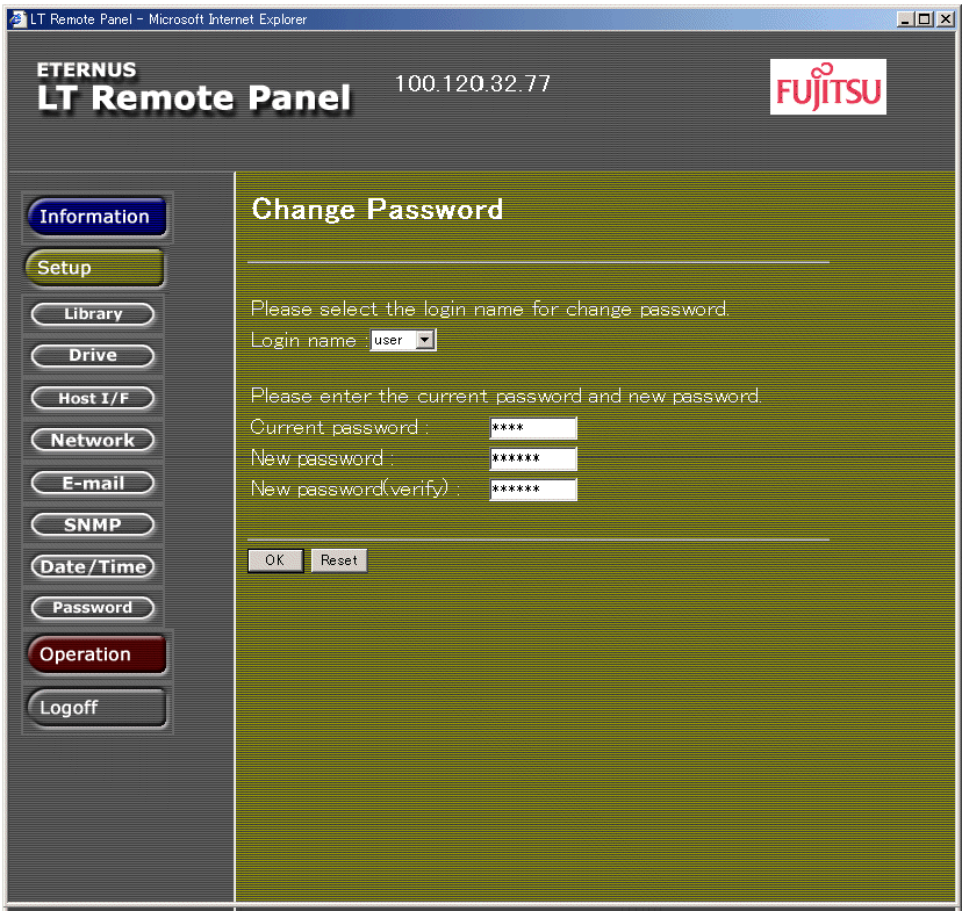


Figure 5.30 Password change window

2) Set each item.

Display item	Explanation
Login name	Select the login name whose password you want to change.
Current password	Enter the current password (one to eight characters). Characters that can be entered are en-size alphanumeric characters and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_'{|}).
New password	Enter a new password (one to eight characters). Characters that can be entered are en-size alphanumeric characters and en-size symbols (!"#$%&'()*+'-./:;<=>?@[\]^_'{|}).
New password	Enter the new password again.

Display item	Explanation
(confirmation)	

3) Click the [OK] button if you want to proceed. If the settings were completed, the system displays a window showing the processing result.

Remarks:

Responsibility for the new password is the user's. Do not forget the password. If you forget the current password, contact maintenance personnel.

5.6 Operating the Library

To operate the library, click the [Operation] button in the menu frame.

5.6.1 Cleaning the drive manually

The library has a special cell to store a cleaning cartridge in each drive. This cleaning cartridge can be used to clean the drive manually.

Remarks:

1. Cleaning cannot be carried out if the cleaning cell of the drive to be cleaned contains no cleaning cartridge, the maximum usage count of all contained cleaning cartridges has been reached, or all of them are in error. In these cases, insert a new cleaning cartridge or replace failed cartridges from the operator panel [See 4.9 "Inserting/Ejecting a Cleaning Cartridge"].
2. The drive is offline while cleaning. The drive goes online automatically after cleaning is completed.

1) Click the [Clean] button displayed under [Operation] to display the following window.

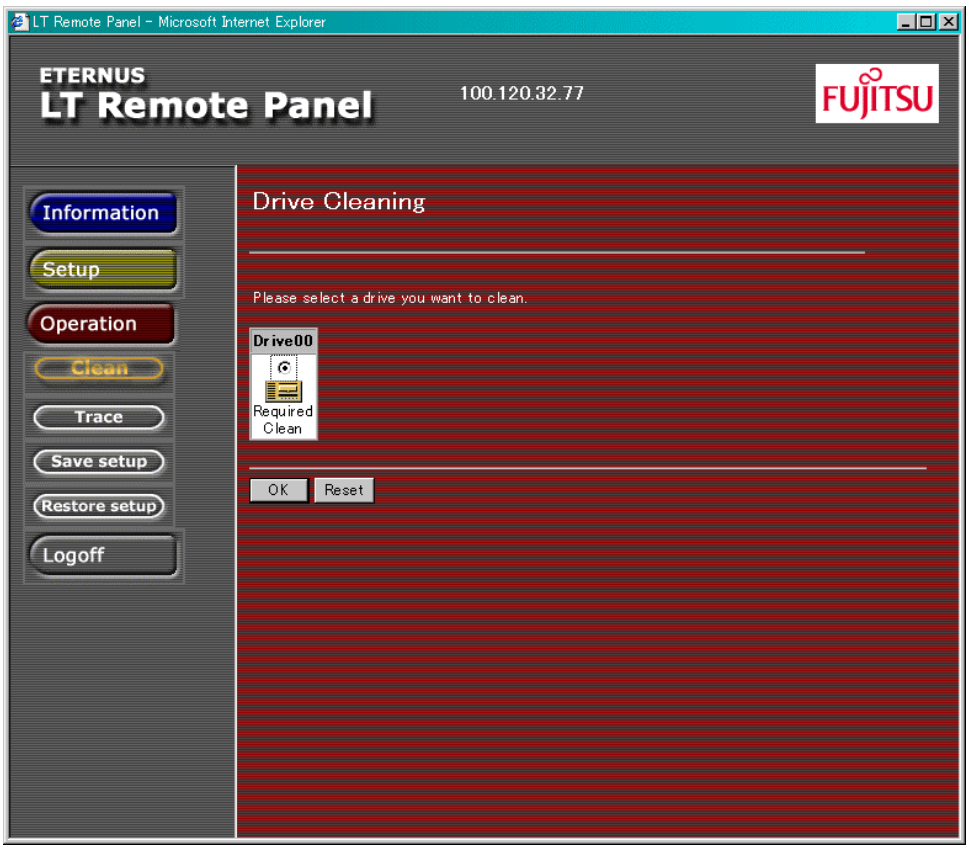


Figure 5.31 Manual cleaning operation window

Drives to be displayed are as follows:

- Drives from which a cleaning request is reported (Clean Required display)
- Drives that require cleaning (Clean Need display)

Remarks:

If [Clean] is selected when there is no drive that requires cleaning, a message "Cleaning not needed" is displayed.

2) Check the drive to be cleaned and then click the [OK] button. Only one drive can be specified.

3) The selected drive is displayed in the confirmation message window.

   Click the [OK] button if it is OK to proceed. To make selections again, click the [Back] button.

4) The system displays a window showing the processing results, completing the manual cleaning.

5.6.2 Operating the trace file

If a hardware error occurs in the library or drive, trace information is automatically stored in a separate file. During trace file operation, the trace of the file currently being traced is stopped, and the trace of a new trace file is started. If the host cannot recognize the library or drive, or if the host cannot access the library or drive, perform a trace file operation that forcibly stores the trace information.

1) Click the [Trace] button displayed under [Operation] to display the following window.

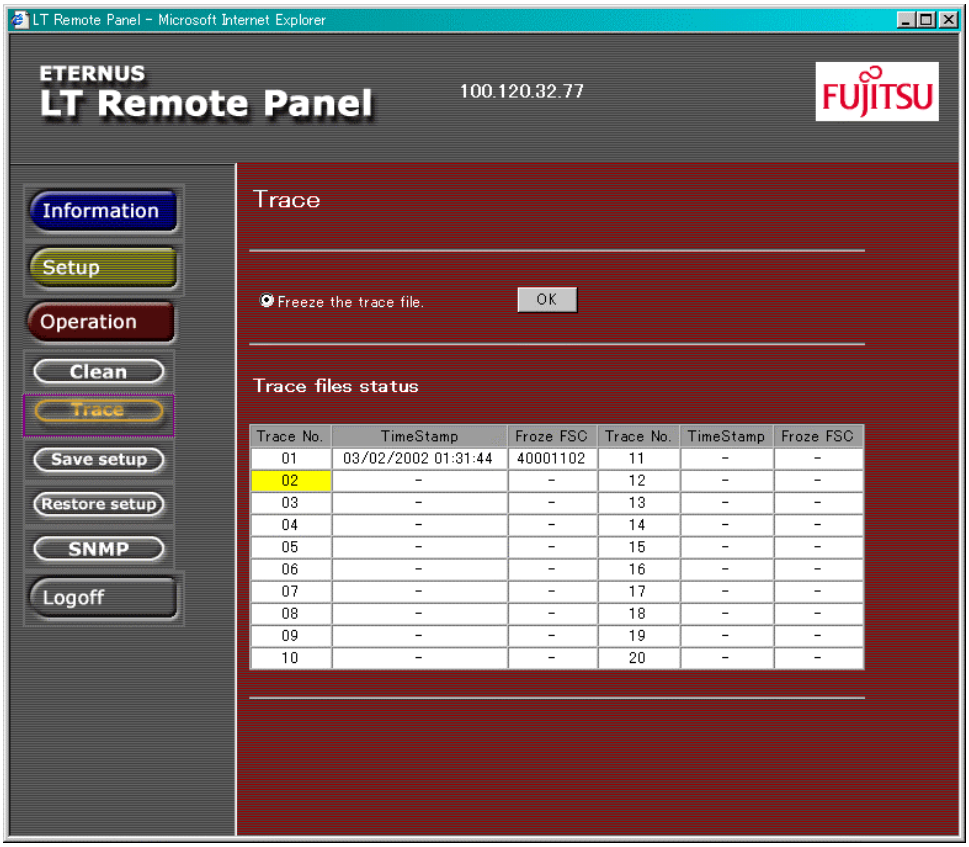

LT Remote Panel - Microsoft Internet Explorer
ETERNUS
LT Remote Panel
100.120.32.77
FUJITSU
Information
Setup
Operation
Clean
Trace
Save setup
Restore setup
SNMP
Logoff
Trace
Freeze the trace file.
OK
Trace files status
Trace No. | TimeStamp | Froze FSC | Trace No. | TimeStamp | Froze FSC
01 | 03/02/2002 01:31:44 | 40001102 | 11 | - | -
02 | - | - | 12 | - | -
03 | - | - | 13 | - | -
04 | - | - | 14 | - | -
05 | - | - | 15 | - | -
06 | - | - | 16 | - | -
07 | - | - | 17 | - | -
08 | - | - | 18 | - | -
09 | - | - | 19 | - | -
10 | - | - | 20 | - | -

Figure 5.32 Trace file operation window

2) To store the trace information, click [OK].

3) When the confirmation dialog box appears, click [OK] to verify storage.

4) After processing is completed, the system displays a window showing the processing results, completing the trace operation.

   The current status of the trace file is displayed on the trace operation window, as follows:

   - Trace No.: Trace file numbers. The number displayed against a yellow background indicates the file currently being traced.
   - TimeStamp: Indicates the time at which the trace file is stored.
   - FSC: Indicates an error code.

   If the trace file is forcibly stored by trace operation from the remote panel, N/A is displayed.

5.6.3 Saving setup information for the library/drive

The following explains the procedure for saving in the PC current settings and log information for the library and drive.

1) Click the [Save Setup] button displayed under [Operation] to display the following window.

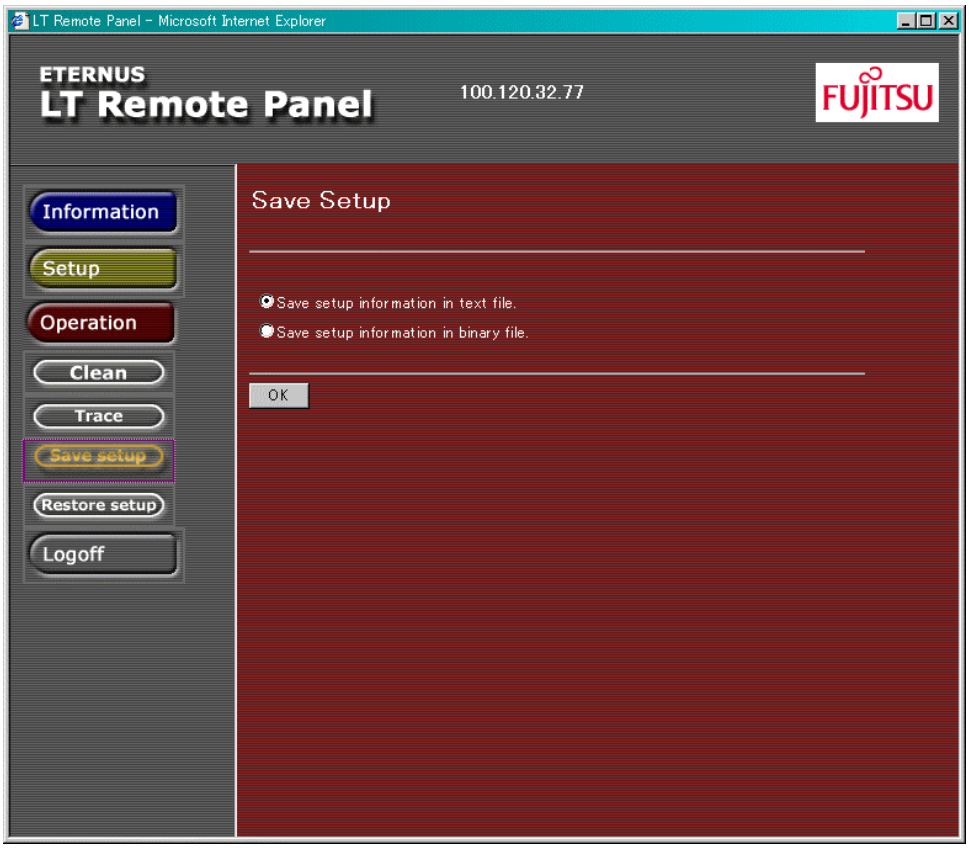


Figure 5.33 Library/drive setup information save window

2) Select the method of saving the setup information.

- If the setup information is saved by selecting "Save setup information in text file," setup contents in the file can be changed manually.
- If the setup information is saved by selecting "Save setup information in binary file," the setup information can automatically be restored using the saved binary file.
- Click "OK." The following window is displayed (*1).

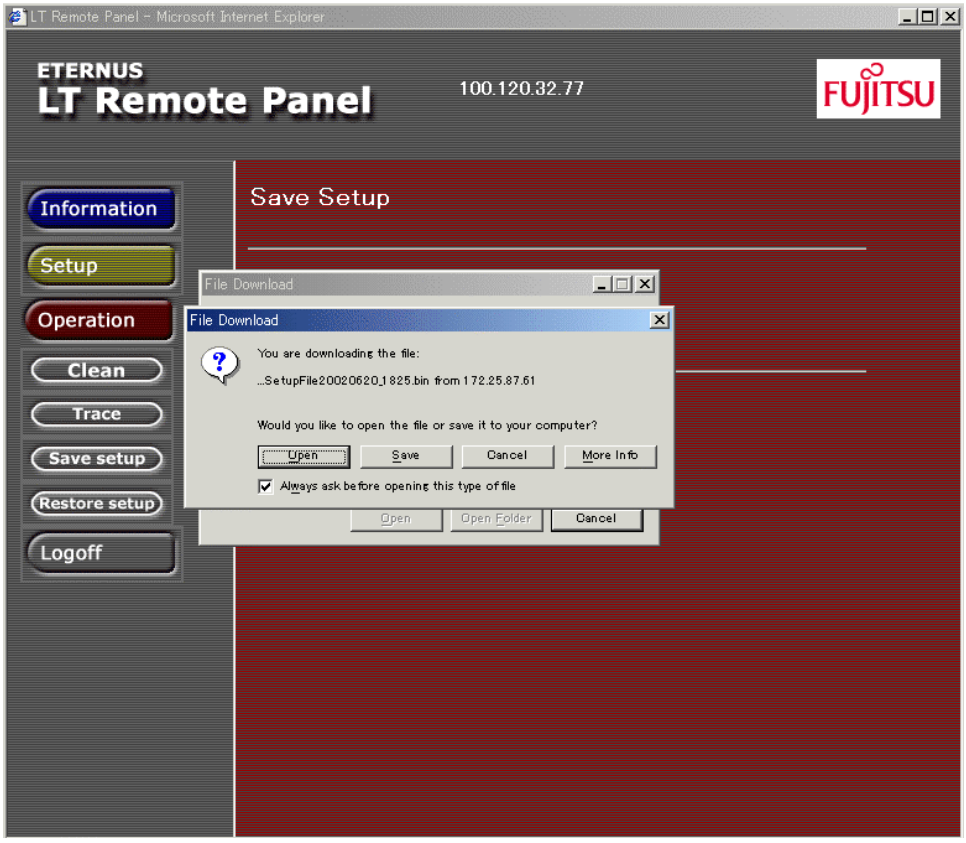


Figure 5.34 Confirming that library/drive setup information has been downloaded

*1 The above window is a window of IE6.0. The display depends on the browser version number and type.

3) Click the [Save] button in the dialog box to display the following window.

4) Select the download destination directory, enter the file name for saving, and then click the [Save] button. The download will start.

5) If the following window is displayed, the download is completed (*1).

*1 The window above may not be displayed depending on the browser settings, version, and type.

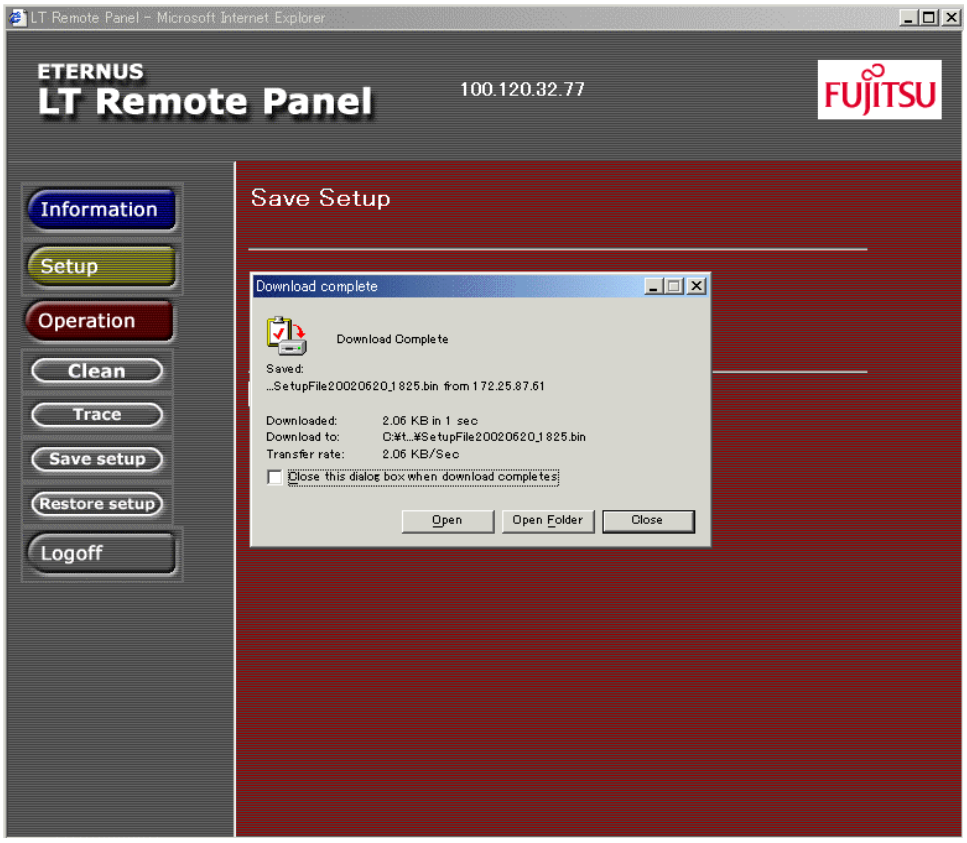


Figure 5.35 Completion of saving setup information for the library/drive

5.6.4 Restoring setup information for the library/drive

Restore the setup information for the library/drive saved in 5.6.3.

1) Click the [Restore Setup] button displayed under [Operation] to display the following window:

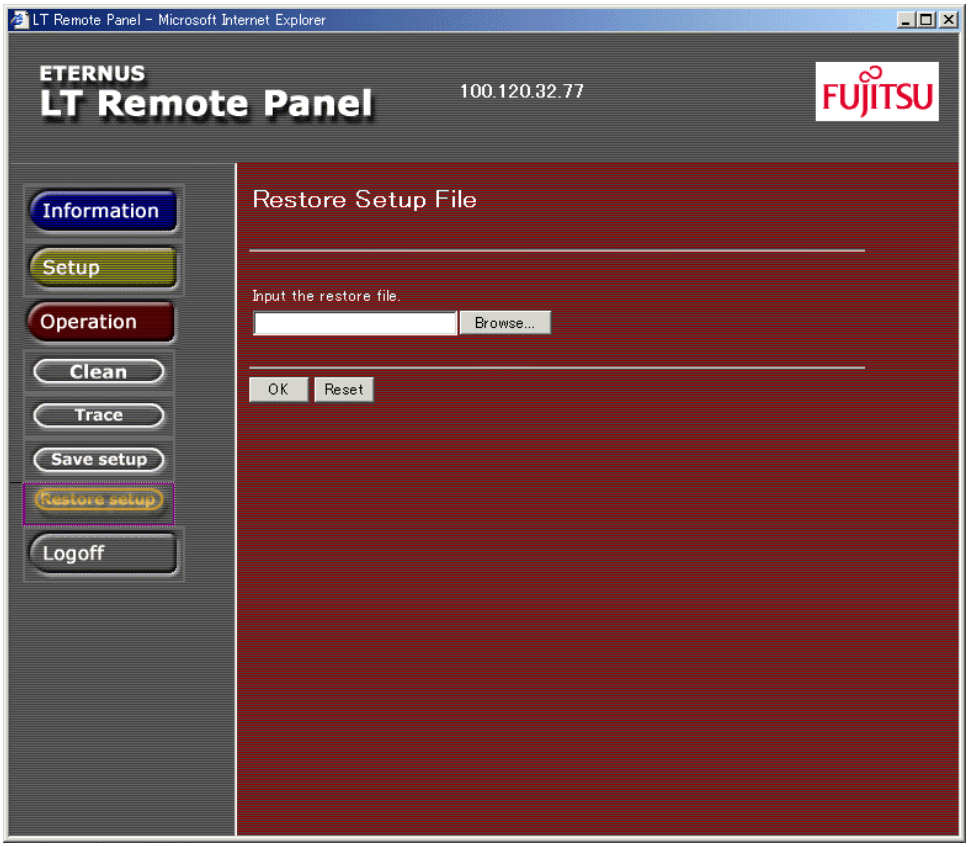


Figure 5.36 Specifying a file from which setup information for the library/drive should be restored

2) Click the [Browse] button to display the following window (*1):

   Enter a file name in the text box. Click the [OK] button after making sure that the file name in the text box is correct.

Remarks:

Click the [Browse] button to select a file.

3) A confirmation message window for starting to restore the setup information is displayed. Click the [OK] button if it is OK to proceed.

4) A window for displaying the processing results is displayed. If the device is restarted, the setup information is restored.

Remarks:

1. If an attempt is made to restore a file that has not been saved, an error message is displayed. Specify a correct file.
2. If Netscape Navigator is used, do not use kana or kanji in the name of a directory that containing a restoration file.

5.6.5 Executing an SNMP trap test

After setting up SNMP, a trap test can be executed to check that a trap is transmitted to the device with the specified IP address.

1) Click the [SNMP] button displayed under [Operation] to display the following window.

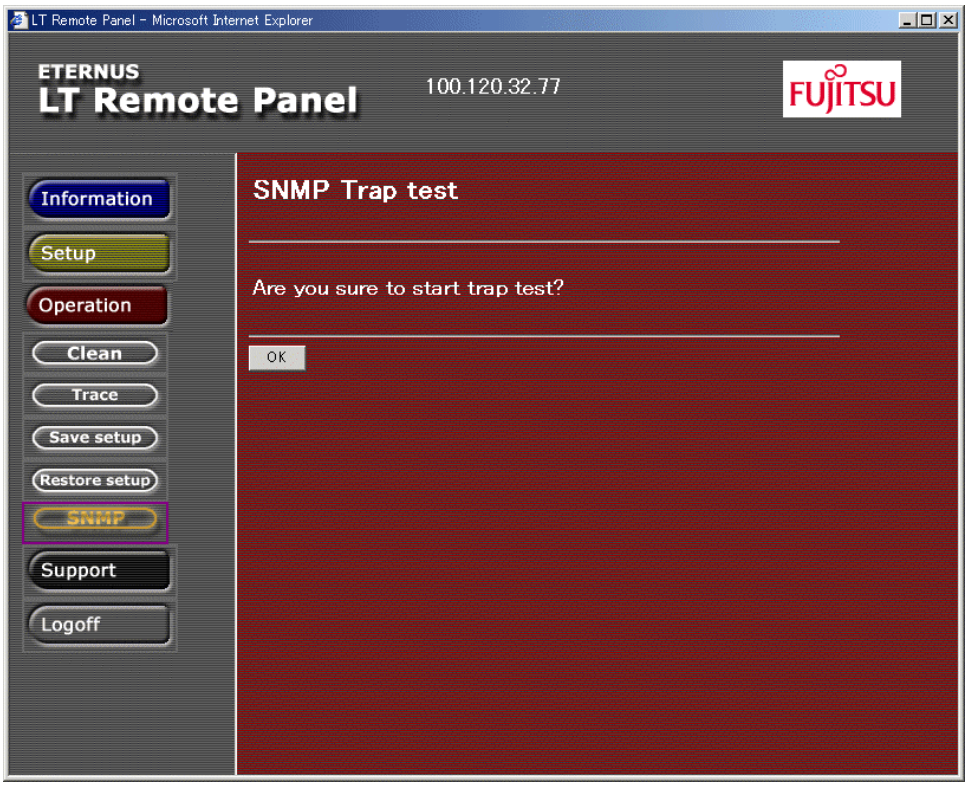


Figure 5.37 SNMP trap test start window

2) To start the trap test, click [OK].

3) After transmission is completed, the following window is displayed. Verify that the trap is transmitted to the device having the specified destination IP address.

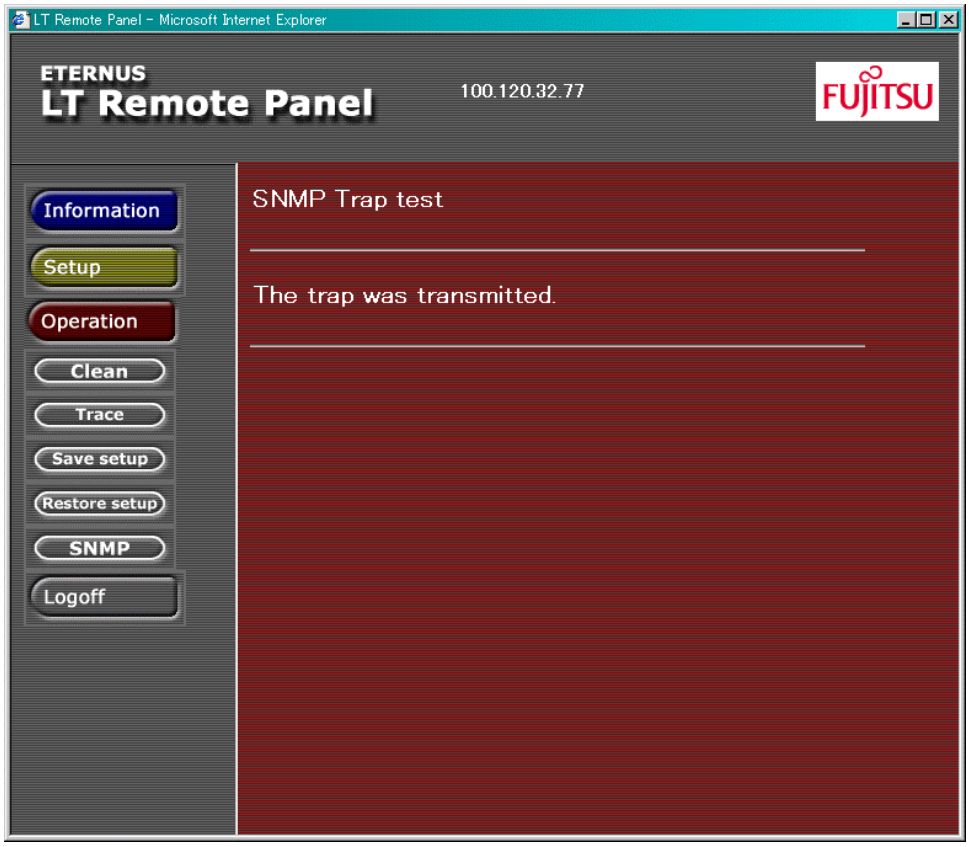


Figure 5.38 SNMP trap transmission completion window

Chapter 6 Troubleshooting

6.1 Drive/Library Maintenance

6.2 Removing Cartridges when an Error Occurs

6.3 Error Status

6.4 General Troubleshooting

6.1 Drive/Library Maintenance

If a hardware error occurs in the drive or library, Error is displayed on the operator panel, and the error becomes unrecoverable. In this case, maintenance is required.

During the execution of work such as to repair the drive or library or replace parts, it is necessary to disable the drive to use another one or to stop the operation itself.

6.1.1 Procedure for the drive maintenance

Follow the procedure below to perform the drive maintenance.

Remarks:

Drive maintenance can also be performed while the library is operating.

1) Disable the drive to be maintained by using the backup software.
2) Perform the drive maintenance (performed by the maintenance person).
3) Enable the drive that has been maintained by using the backup software.

6.1.2 Procedure for the library maintenance

Follow the procedure below to perform the library maintenance.

Turn off the library before starting the library maintenance.

During execution of library maintenance, stop the operation of the backup software.

1) Stop the operation of the backup software.
2) Perform the library maintenance. (Work of a maintenance person.)
3) Resume the operation of backup software.

6.2 Removing Cartridges when an Error Occurs

6.2.1 Removing cartridges from the hand mechanism when the robot fails

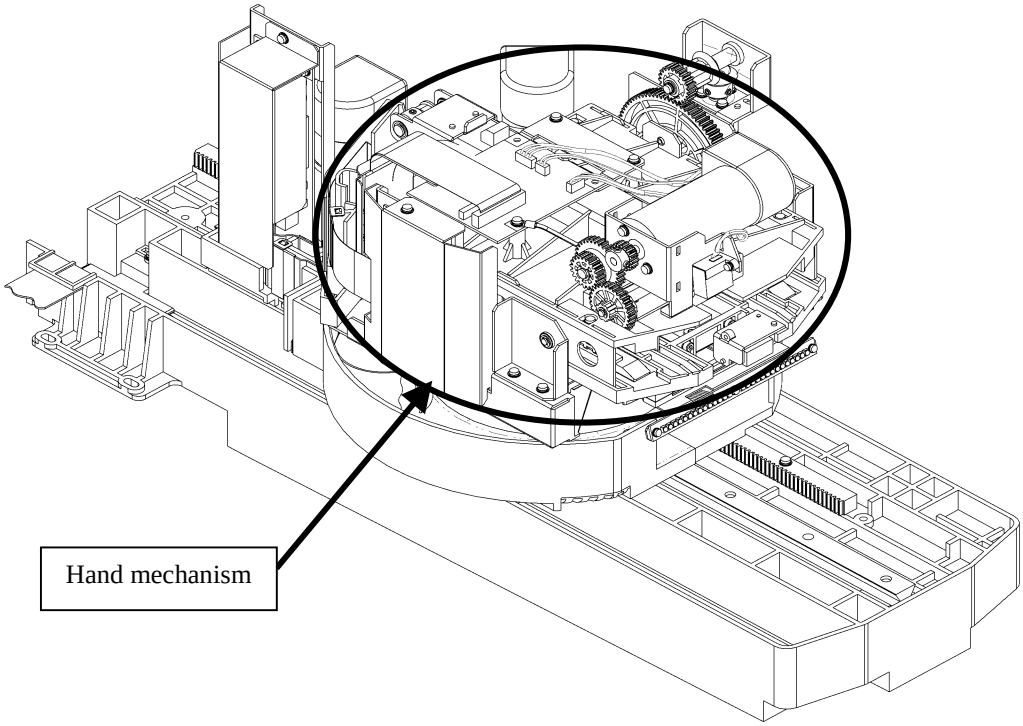


Figure 6.1 Hand mechanism

Cartridges can be pulled out of the hand mechanism (Figure 6.1) by following the procedure below.

1) Rotate the "gear (intermediate section)" (*1) as shown in Figure 6.2.

*1 Of the three gears, the "gear (intermediate section)" refers to a set of coaxial gears with different diameters.

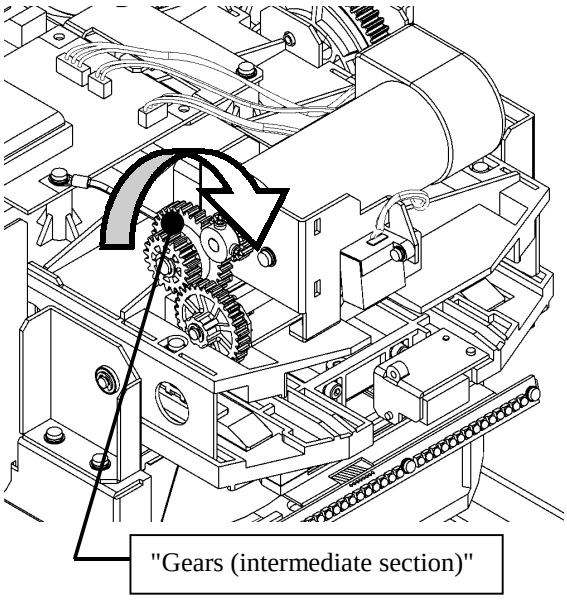


Figure 6.2 Procedure 1 for removing cartridges

2) Start to rotate the gear. Cartridges will come out of the hand mechanism (Figure 6.3). Manually hold the tip of cartridges that come out to ensure that cartridges do not fall when they are released by the hand mechanism.

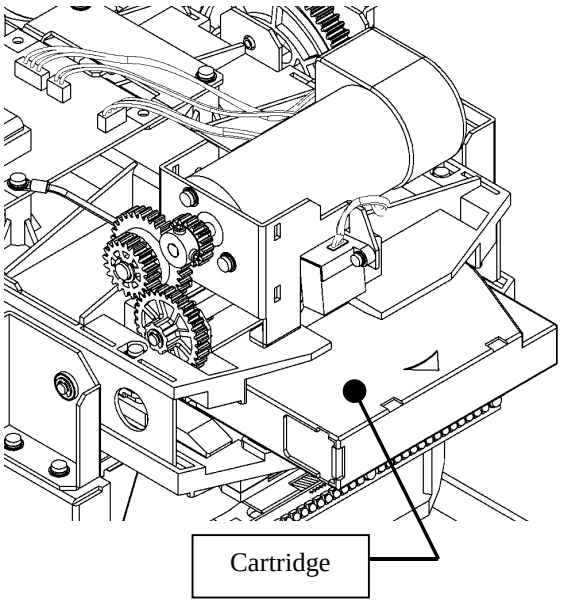


Figure 6.3 Procedure 2 for removing cartridges

3) Continue to rotate the gear to eject more cartridges until they are released by the hand mechanism.

   If the cartridges are released by the hand mechanism, pull them in the direction shown in Figure 6.4 to remove them.

Remarks:

Be sure to store the cartridges just taken out at a specified location.
Do not leave them on the robot or the floor inside the device.

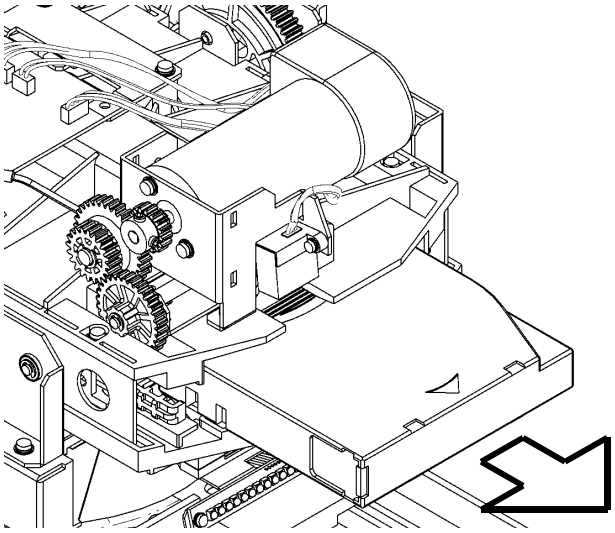


Figure 6.4 Procedure 3 for removing cartridges

4) After removing the cartridges, rotate the set of coaxial gears (intermediate section) in the direction shown in Figure 6.5 to put the internal mechanism inside the hand mechanism (It is sufficient to move the internal mechanism so that it barely extends from the hand mechanism.).

Remarks:

If the robot moves while the internal mechanism of the hand mechanism is extended from the hand, it may hit cartridges stored in the cell or the drive. After removing cartridges, be sure to put the internal mechanism inside the hand mechanism.

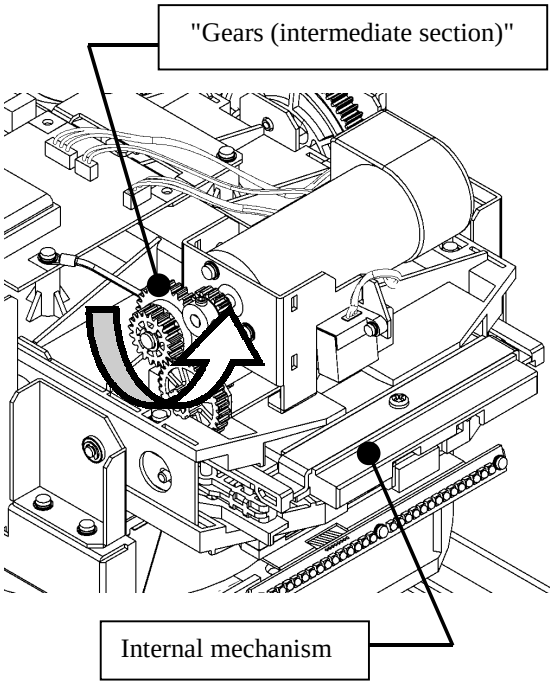


Figure 6.5 Procedure 4 for removing cartridges

6.2.2 Removing cartridges from CAS when the CAS external door cannot be opened

If the external door of CAS cannot be opened from the operator panel because, for example, the device fails or is not powered on or if the operator panel cannot be used, it is possible to open the external door of CAS manually to remove the magazine inside it.

The following explains how to do this:

1) Open the front door of the device.

2) Insert a thin bar of about 4 mm in diameter into the slit for unlocking at the lower right corner of the external door of CAS and push it until the external door is unlocked (See Figure 6.6).

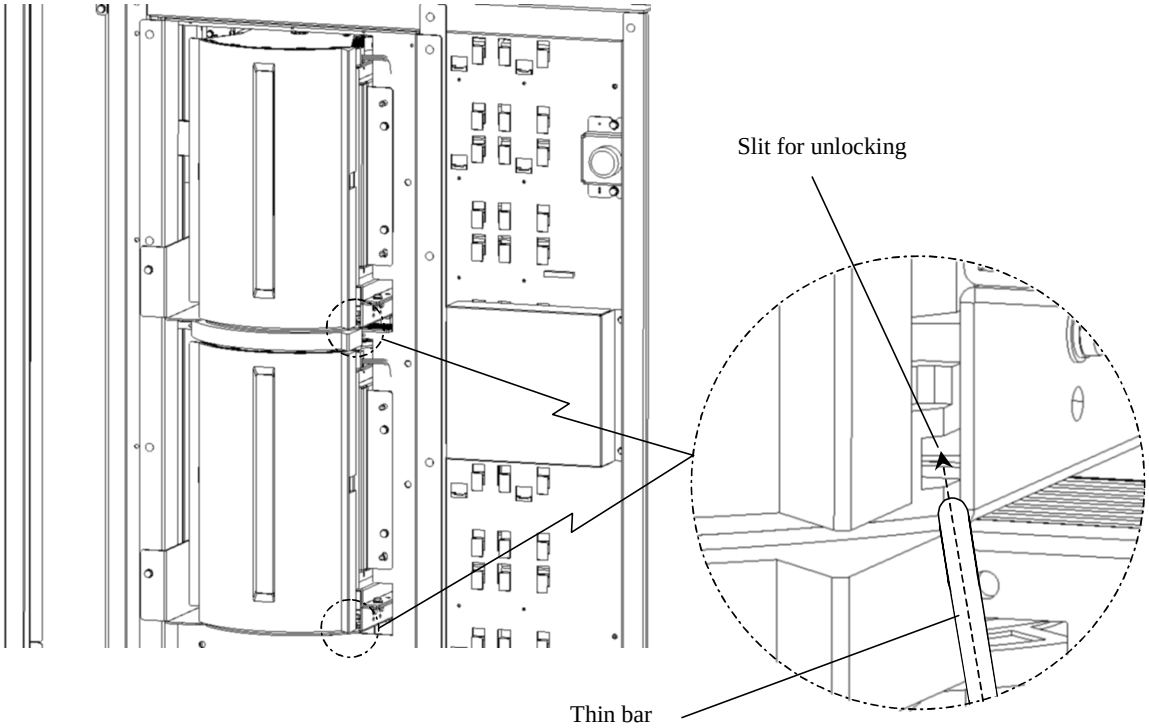


Figure 6.6 Unlocking the external door of CAS

3) When unlocked, the external door opens slightly.
Completely open the CAS external door by hand and then remove the magazine (See Section 1.1.5.2, "Ejecting cartridges from the magazine").

4) Remove cartridges from the magazine (See Section 1.1.4.2, “Ejecting a magazine from CAS”).

6.3 Error Status

6.3.1 Error type of the drive

The error type of the drive is displayed in the home window of the operator panel (See Figure 6.7) and the Information/Status menu of the remote panel.

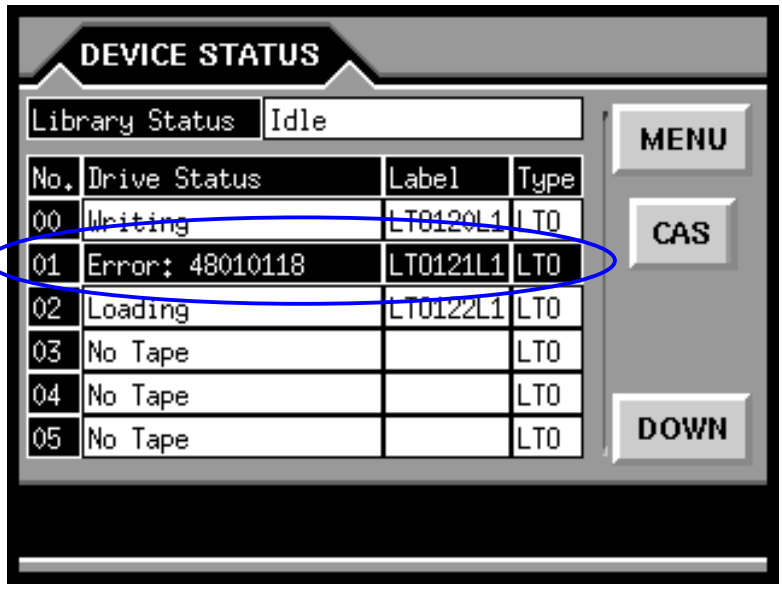


Figure 6.7 Operator panel window when a hardware error occurred in the drive

Table 6.1 Error type of the drive

Error type	Explanation	Action
Error	Indicates that, due to a hardware error, operation cannot be continued. Fault Symptom Code is also displayed.	Release the error by performing the reset operation from the operator panel. If the error cannot be released, report to the maintenance person.
Media Error	Indicates that operation cannot be continued because an unusable cartridge has been loaded or a cartridge error was detected.	Eject the cartridge by performing the reset operation from the operator panel. Do not use a failed cartridge or consult with the supplier.
Fan Alarm	Indicates that a rotation error occurred in the cooling fan within the drive module.	If a rotation error is detected, the drive power is automatically cut off several minutes later for safety reasons.

6.3.2 Error type of the library

6.3.2.1 Hardware error of the library

If a hardware error of the library occurs, "Error" is displayed in the home window of the operator panel (See Figure 6.8) and the Information/Status menu of the remote panel. Fault Symptom Code is also displayed. At the same time, the Library Error icon goes on in the icon area of the operator panel.

If a hardware error of the library occurs, perform the reset operation from the operator panel to release the error. If the error cannot be released, report it to the maintenance person.

Remarks:

Details of hardware errors of the library can be referenced from the INFORMATION/Error Log/Library menu of the operator panel and the INFORMATION/Error History menu of the remote panel.

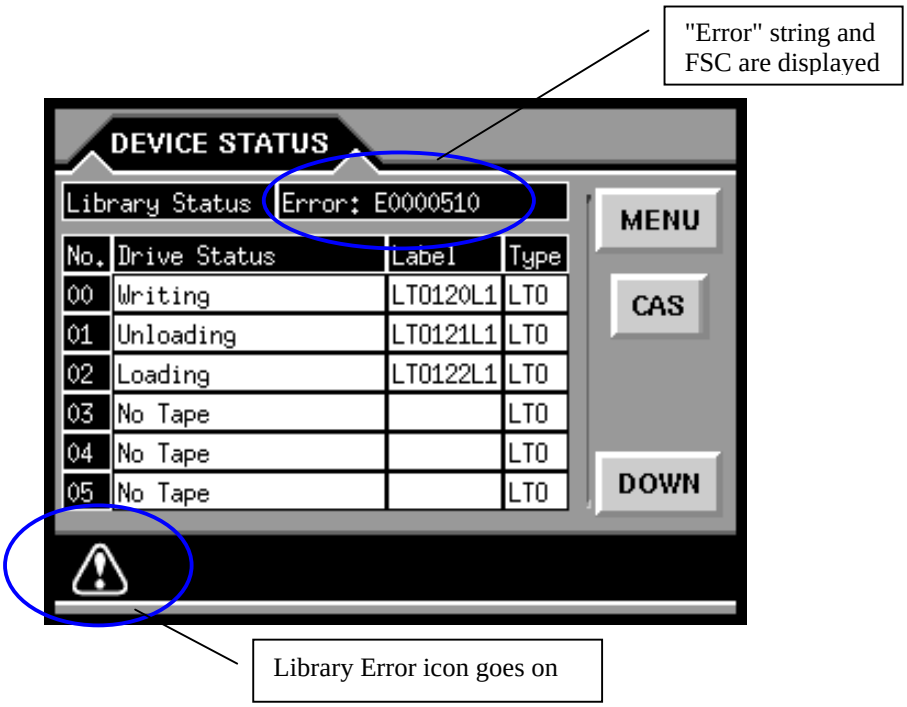


Figure 6.8 Operator panel window when a hardware error of the library occurs

6.3.2.2 Library alarm error

If a library alarm error occurs, the Library Alarm icon goes on in the icon area of the home window (See Figure 6.9) of the operator panel.

Remarks:

Details of library alarm errors can be referenced from the INFORMATION/Error Log/Alarm List menu of the operator panel and the INFORMATION/Error History menu of the remote panel.

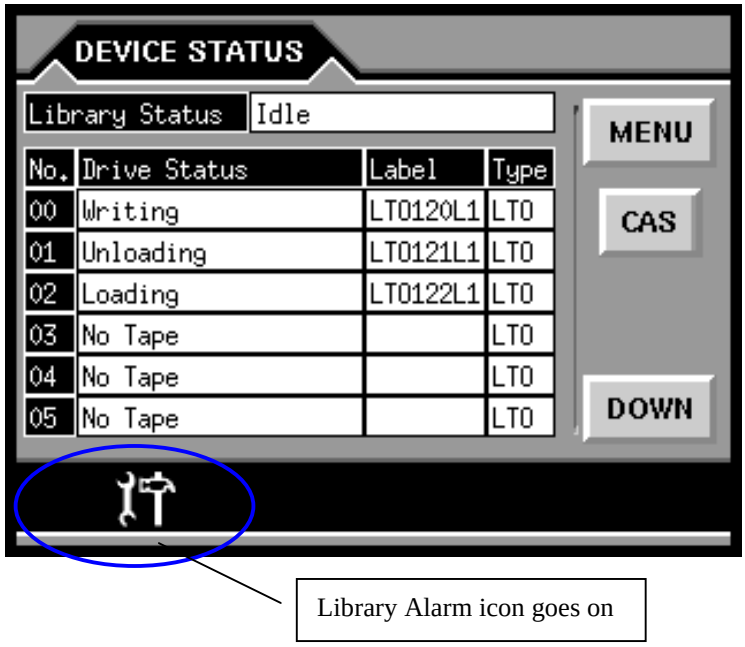


Figure 6.9 Operator panel window when a library alarm error occurs

6.4 General Troubleshooting

This section explains the troubleshooting procedure for this library device. For information about problems and troubleshooting related to the host and application software, refer to the manuals for each host system and applications. If the problem still cannot be solved, report it to the maintenance person.

⚠ CAUTION

Data loss: Before turning off and then turning on the power again, consult with the system administrator. Do not turn off and then turn on the power when the interface is active. Otherwise, data loss or a hang-up of the host system may occur.

6.4.1 Power

- Library power is not on.
  - -- Check all power cable connections.
  - -- Confirm that the power switch is turned on.
  - -- Confirm that all power outlets are live. Try other outlets.
  - -- Confirm that the library is receiving power by checking that the LED lamp on the back of the device is on and that the fan is rotating.
  - -- If the problem still cannot be solved, contact maintenance personnel.
- The power-on test fails, or an error message is displayed on the operator panel.
  - -- Perform recovery from the operator panel.
  - -- Write down the error code and contact maintenance personnel.

6.4.2 Connections

- The LOOP ID of the drive has been changed, but the host computer cannot identify the new ID.
  - -- Confirm that all the devices on the same FC bus have different IDs.
  - -- Restart the host.
  - -- Contact maintenance personnel.
- The host does not detect the library.
  - -- Confirm that the correct HBA is used.
  - -- Confirm that the addresses are set correctly.
  - -- Confirm that the operating system, HBA, and driver are set up correctly.
  - -- Confirm that the zones are set up correctly.
  - -- Confirm that the cables are connected correctly.
  - -- Confirm that the operating system recognizes the library as normal.
  - -- Confirm that the backup software is compatible with the library.

-- Turn on the library again, and turn off the host. Do not turn on the host again until the power-on process of the library is completed.

-- To use the Fibre Channel, turn the devices on in the correct order (switch, library, and host).

-- Contact maintenance personnel.

6.4.3 Cartridge

- Writing to tape fails.

  -- Confirm that the write protect tab is set to write enabled.

  -- Confirm that the overwrite-disabled setting of the backup software is off.

  -- Check the file system access permissions of the host device.

  -- Confirm that the correct type of tape is being used.

  -- Try using a new tape.

⚠ CAUTION

Damage to the library: During troubleshooting, do not insert a defective tape into another drive. The defective tape may damage the drive.

- Tape is stuck in the drive.

  -- Turn the library off and then on again, and try using the operator panel to eject the tape.

  -- Confirm that the backup host software has not reserved the slot. If the slot has been reserved, the reservation must be cancelled.

  -- Perform a reset operation from the operator panel to check if the tape is ejected.

  Contact maintenance personnel.

6.4.4 CAS

- The CAS cartridge cannot be accessed.

  -- From the operator panel, open the target CAS door. Then remove the magazine.

  -- Remove the tape.

  -- Reinsert the magazine.

  -- If the magazine is defective, contact maintenance personnel.

6.4.5 Compatibility

- The cleaning or data cartridge is not compatible with the drive.

  -- Confirm that a cleaning or data cartridge compatible with the drive is being used.

  -- Confirm that the correct barcode label is affixed.

6.4.6 Library performance

- Poor library performance
  - -- Check the network bandwidth on the host computer.
  - -- Confirm that the FC path of the drive is not shared with other devices such as a disk unit.
  - -- Confirm that the drive is clean.
  - -- Use new tape. The use of deteriorated tape adversely affects performance because access is retried on deteriorated sections of the tape.
  - -- Confirm that fixed-length records (or blocks) are used and that a small record size is not set so that the backup software can attain maximum throughput.
  - -- Confirm that the data is compressed.

6.4.7 Cleaning

- The clean drive icon is displayed if a new cartridge is used.
  - -- Clean the drive.
  - -- Replace the cartridge if this icon is displayed again in a short period.
- The cleaning message is displayed repeatedly.
  - -- Confirm that you are using a cleaning cartridge recommended for the drive type being used.
  - -- Replace the cleaning cartridge with a new one.
  - -- If this message is displayed again while a specific cartridge is being used, clear the error message and read the cartridge again. If the cartridge can be read, back up data to another cartridge and dispose of the defective cartridge.
- The cleaning cartridge cannot be loaded.
  - -- Confirm that you are using a cleaning cartridge recommended for the drive type being used.

6.4.8 Operator panel

- The operator panel is not displayed.
  - -- Confirm that the power cord is connected.
  - -- Confirm that the power switch is turned on.
  - -- Confirm that the LED lamp on the rear of the library is on and that the fan is rotating.
  - -- Confirm that the operator panel's screen saver function is not running. (Touch the operator panel.)
  - -- Turn the library power off and then on again.
  - -- Access the library via the remote panel.
  - -- If the problem still cannot be solved, contact maintenance personnel.
  - -- Contact maintenance personnel.
- The operator panel is inoperative.
  - -- Turn the library power off and then on again.
  - -- Access the library via the remote management card.

-- Access the library from the host computer.

-- Contact maintenance personnel.

6.4.9 Remote panel

- The remote panel cannot be connected.
  -- Confirm that the network settings of the device are correct.
  -- Confirm that cookies and JavaScript are enabled in the browser settings.
  -- The recommended browsers are Microsoft Internet Explorer 5.0 to 6.0 and Netscape Navigator 4.7 to 4.78.
  -- Replace the LAN cable.
  -- Contact maintenance personnel.
- The login password for a user or user administrator has been forgotten.
  -- Contact maintenance personnel.

Chapter 7 Cartridge Media and Bar Code Label Specifications

7.1 Ultrium Cartridge Information

7.2 Replacement Period

7.3 Handling the Tape cartridge

7.4 Bar Code Label Specification and Handling

7.5 Precautions to Follow when Using the Cartridge

7.1 Ultrium Cartridge Information

LT160 uses the tape cartridge for LTO Ultrium 1 listed in Table 7.1.

Table 7.1 Tape cartridge specifications

Type	Type A	- (*2)
Product name	Ultrium 1 100GB data cartridge	Ultrium 1 universal cleaning cartridge
Supply number	0160210	0160280
Form	Single reel tape cartridge	←
Tape width	12.65 mm (1/2 inch)	←
Tape length	609m	-
Storage capacity (*1)	100GB (200GB)	-
External dimensions	102×105×21.5mm	←

*1 The storage capacity value in the specification is a nominal value. The value in ( ) is the storage capacity when data is compressed by 2:1.

*2 We recommend using the Ultrium 1 cleaning cartridge sold by Fujitsu CoWorCo. The maximum number of times of using the cartridge when used in LT160 is 50.

The traditional magnetic tape drive largely depended on the starting section of the tape because the directory information in the starting section of the tape needs to be read each time the tape is read. The LTO Ultrium cartridge, on the other hand, contains non-contact type cartridge memory (EEPROM). This memory can record the directory information, reducing the number of times of reading the tape and the load on the starting section of the tape.

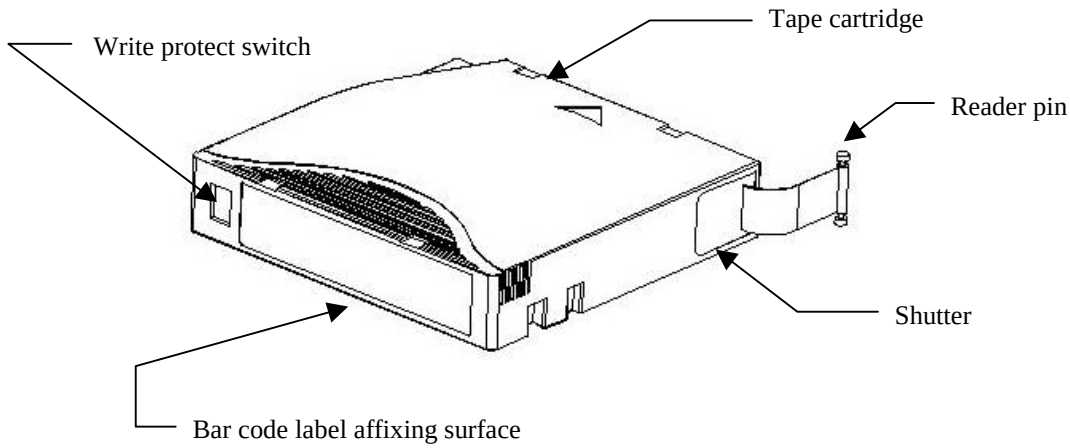


Figure 7.1 LTO Ultrium 1 tape cartridge

7.2 Replacement Period

The data tape cartridge is sold separately by Fujitsu CoWorCo. Though data tape cartridges with similar forms from other companies can also be used if the "Ultrium" logo is affixed, we strongly recommend purchasing genuine parts from Fujitsu CoWorCo. Data tape cartridges are stored under the storage environment conditions listed in Table 7.2 and can be used for more than 30 years if not damaged. However, for safety reasons, we recommend replacing them in the following periods:

- If used for one backup operation every day, replace the tape with a new one after two years.
- If used for one backup operation every week, replace the tape with a new one after 10 years.
- Even if the tape is used for one backup operation per period greater than one week, we recommend replacing the tape with a new one after 10 years at the latest.

7.3 Handling the Tape cartridge

Be careful when handling the tape so that its performance and reliability can be secured. Because the tape cartridge is a consumable supply, more errors tend to occur as the tape is used.

The following explains precautions to follow when handling the tape:

7.3.1 Notes on storage

Table 7.2 lists the environment conditions for storing recorded tapes.

Table 7.2 Environment conditions for storing the tape cartridge

Item	Condition
Temperature	16 to 32°C
Humidity	20 to 80%RH
Max wet bulb temperature	26°C max
Others	No condensation

In addition, the following precautions must be taken:

- If stored for a long period of time, the tape cartridge should be stood upright for storage.
- Keep tape cartridges away from environments exposed to direct sunlight or large quantities of dust.
- Do not put the tape cartridge near a power cable, motor, and power supply. Otherwise, recorded data may be damaged by the magnetic radiation fields.

7.3.2 Notes on transportation

Table 7.3 lists the environment conditions for transporting the tape.

Table 7.3 Environment conditions for transporting the tape cartridge

Item	Condition
Temperature	-23 to 49°C
Humidity	5 to 80%
Max wet bulb temperature	26°C max
Magnetic field	4000 A/m or less
Others	No condensation

In addition, the following precautions must be taken:

- Use the tapes brought from outside after letting them adjust to the operation environment conditions for as long as the external storage period (up to 24 hours) to avoid rapid environment changes.
- Transport the tapes by storing them in a container so that they can be protected from flood, dirt, magnetic fields, temperature changes, vibration, and shock.

7.3.3 Notes on handling

- Do not stack tape cartridges high because they may be damaged by falling (stack volumes up to six high). If a tape cartridge is mistakenly damaged by falling, perform data migration immediately after data recovery and then discard the damaged tape cartridge.
- The support track is written into the LTO Ultrium 1 tape cartridge in advance and correct read/write operations are performed based on this information. Though it is possible to delete data using a special device (1200 oersted or more) for the purpose of ensuring data security, the tape whose data has been deleted cannot be reused because the support track has also been deleted.
- Adhesive constituents of binder in the tape may melt and adhere to the magnetic head, corroding the MR elements in the head and causing read/write errors. This results from chemical deterioration of the tape and has nothing to do with the number of times of using the tape. Thus, this problem cannot be resolved by cleaning the tape. Because those constituents tend to melt with the increasing temperature and humidity at which the tape cartridge is stored, sufficient attention needs to be paid to the storage environment conditions. Dispose of tapes with the head to which those constituents adhere.

7.3.4 Notes on the reader pin

- Before inserting into the device, make sure that the reader pin is on the tape cartridge. If the reader pin has been detached from a recorded tape, attaching the reader pin to the tape can make the tape reusable. However, only the first 30 cm from the tape tip can be restored.
- When loading the tape, make sure that the reader pin is securely latched.
- Because the tape cartridge is a precision-made product, do not apply unreasonable force or pull out the reader pin and tape. Do not push or rotate the reel.

7.3.5 Notes on label affixing

Affix highly adhesive labels to the tape. Labels that come off inside the device may cause device failures. Use labels supplied with the tape or genuine labels sold by Fujitsu CoWorCo.

7.4 Bar Code Label Specification and Handling

By affixing the bar code label to the tape, the volume can be registered by reading the bar code, thereby reducing the time required for registration. For the bar code label used for this library, use a genuine one sold by Fujitsu CoWorCo.

- Bar code label: ULB1
- Supply number: 0.637150

Remarks:

In this library, the bar code label used in the magnetic tape library device F6455/F6456/F6457/F6458/LT300N of Fujitsu cannot be used.

Be sure to affix the barcode label to the tape cartridge that is used for LT160. For information about affixing the label, see Section 7.4.2, "Notes on label affixing."

7.4.1 Specifying the label string

When purchasing the label, specify the 8-digit string of "volume area + cartridge area".

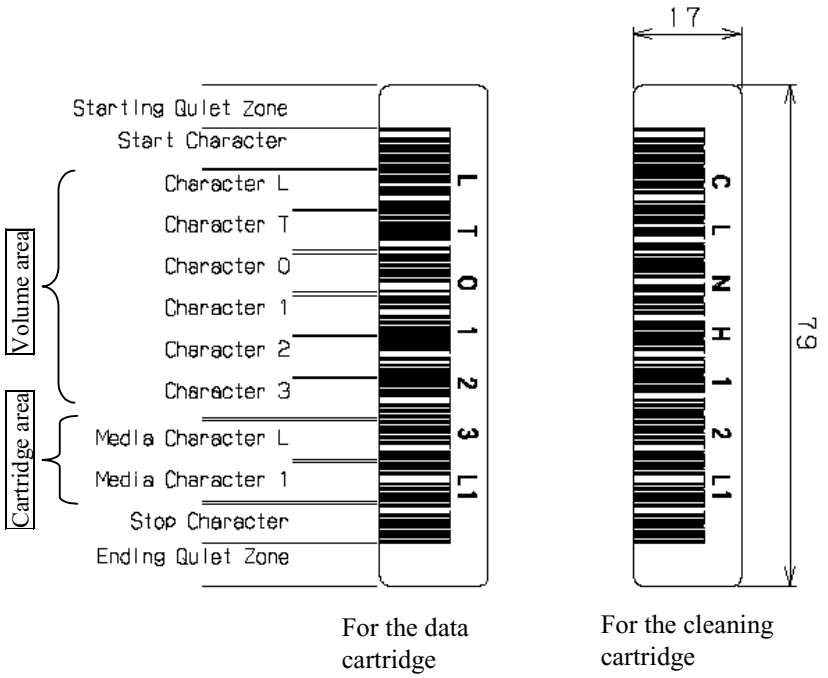


Figure 7.2 Bar code label string

7.4.1.1 Specify the volume area

Any 6-digit string excluding "CLNOOO" and "DG(space)OOO" (OOO are arbitrary) can be specified as the string for the volume area. Table 7.4 lists characters that can be used for the volume area.

Table 7.4 Usable characters

Character type	Description
Upper-case alphabetic character	26 characters ranging from A to Z
Numeric character	10 characters ranging from 0 to 9

7.4.1.2 Deleting the media area

The media area is fixed at "L1."

7.4.1.3 Specifying the label for cleaning cartridge

Specify the serial number of the label for cleaning cartridge as "CLNIOOL1" (OO are arbitrary).

7.4.2 Notes on label affixing

- Keep the label affixing surface clean and do not leave fingerprints and finger marks on it.
- Affix the bar code label on the specified location (concavity beside the write protect switch) of the tape cartridge correctly (See Figure 7.3). If the label is affixed at an incorrect location or such that is orientation is incorrect, the bar code may become unidentifiable. After affixing the bar code label, press on it firmly. Notice that the end parts of the label are easily broken.
- To replace the label, peel the old label from the tape and then affix a new one.

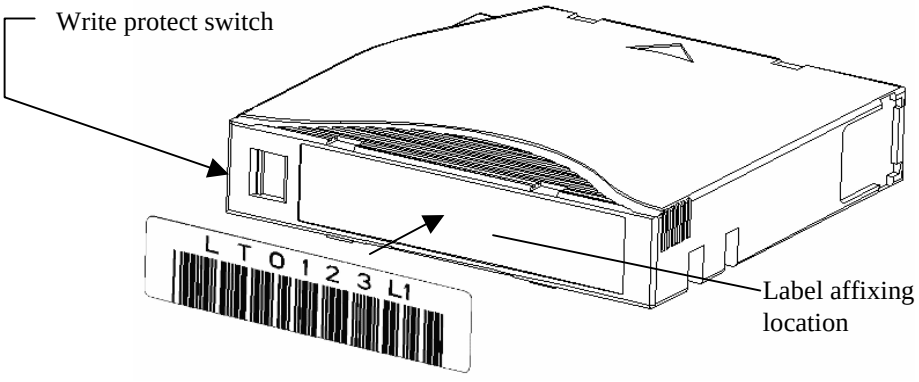


Figure 7.3 Bar code label affixing location

7.5 Precautions to Follow when Using the Cartridge

- The tape drive of LT160 is dedicated for the LTO Ultrium 1 tape cartridge. Tape cartridges such as DLT, 8 mm, DAT, and LT300 cannot be used. The tape cartridge for LT120 can be used.
- The tape cartridge for recording data and the cleaning cartridge are consumable supplies. Although one volume of each cartridge is supplied with the device, be sure to purchase them separately. For details of the specifications, see Section 7.1, "Ultrium Cartridge Information."
- The cleaning cartridge can be used a maximum of 50 times. If the maximum number is reached, replace the cleaning cartridge.
- The cleaning cartridge for an LT120 cannot be used.
- To use a tape cartridge that was used in another library device in this library, check the following points. If any relevant point is found, perform recovery work or replacement with a new one before using LT160.

  -- Label

  Use a genuine Fujitsu CoWorCo label for the bar code label to be affixed to the cartridge. For details of the specifications, see Section 7.4, "Bar Code Label Specifications and Handling."

  -- Reader pin

  Check for any reader pin that has been detached from the cartridge. For details, see Section 7.3.4, "Notes on the reader pin."

  -- Replacement period of the tape cartridge

  The tape cartridge is consumed due to mechanical abrasion and chemical deterioration of magnetic material. If storage under the environment conditions recommended by Fujitsu is assumed, the service life of the tape cartridge is about 30 years. However, if circumstances such as the environment for use, number of times of use, and storage environment are considered for actual operation, we recommend replacing the tape cartridge with a new one, following as guideline the replacement period described in Section 7.2, "Replacement Period."

Appendix A Model Configuration

A.1 Model Configuration of Basic Model A20 (10 drive options/98 cell options/10 CASs)

A.2 Model Configuration of Basic Model A20 (10 drive options/182 cell options/10 CASs)

A.3 Model Configuration of Basic Model A20 (10 drive options/221 cell options/10 CASs)

A.4 Model Configuration of Basic Model A32 (16 drive options/89 cell options/10 CASs)

A.5 Model Configuration of Basic Model A32 (16 drive options/167 cell options/10 CASs)

The following table lists the configuration of the numbers of cell options, drive options, and CAS of the two basic models (A20 and A32).

Basic model name	Cell option (number of cells)			Drive option (number of drives)	CAS (*)
A20	98	182	221	10 (Max)	10 (2)
A32	89	167	--	16 (Max)	10 (2)

Note: The value in ( ) is the number of magazines.

The following shows each model configuration in this appendix.

Remarks:

Explanation of symbols in the configuration diagram of each model
F: Indicates a flag for positioning the accessor (cartridge transport element).
EX: Indicates an Exchange cell.
R: Indicates a reserve cell.
D: Indicates a diagnostics cell.
CL: Indicates a cleaning cell.
Other values indicate a CAS, cell, or drive that is used from the operator panel or remote panel.

A.1 Model Configuration of Basic Model A20 (10 drive options/98 cell options/10 CASs)

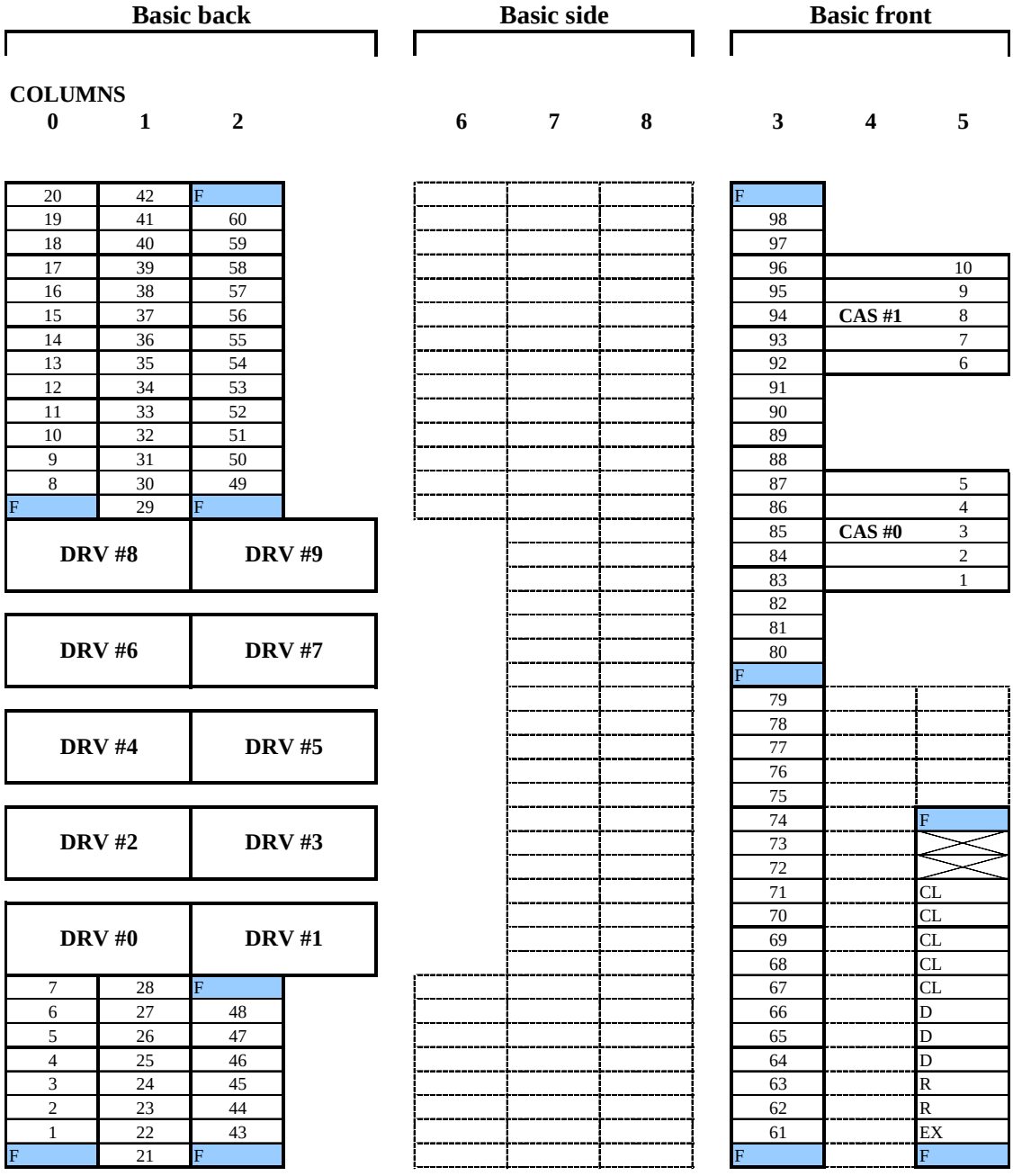


Figure A.1 Model Configuration of Basic Model A20 (10 drive options/98 cell options/10 CASs)

A.2 Model Configuration of Basic Model A20 (10 drive options/182 cell options/10 CASs)

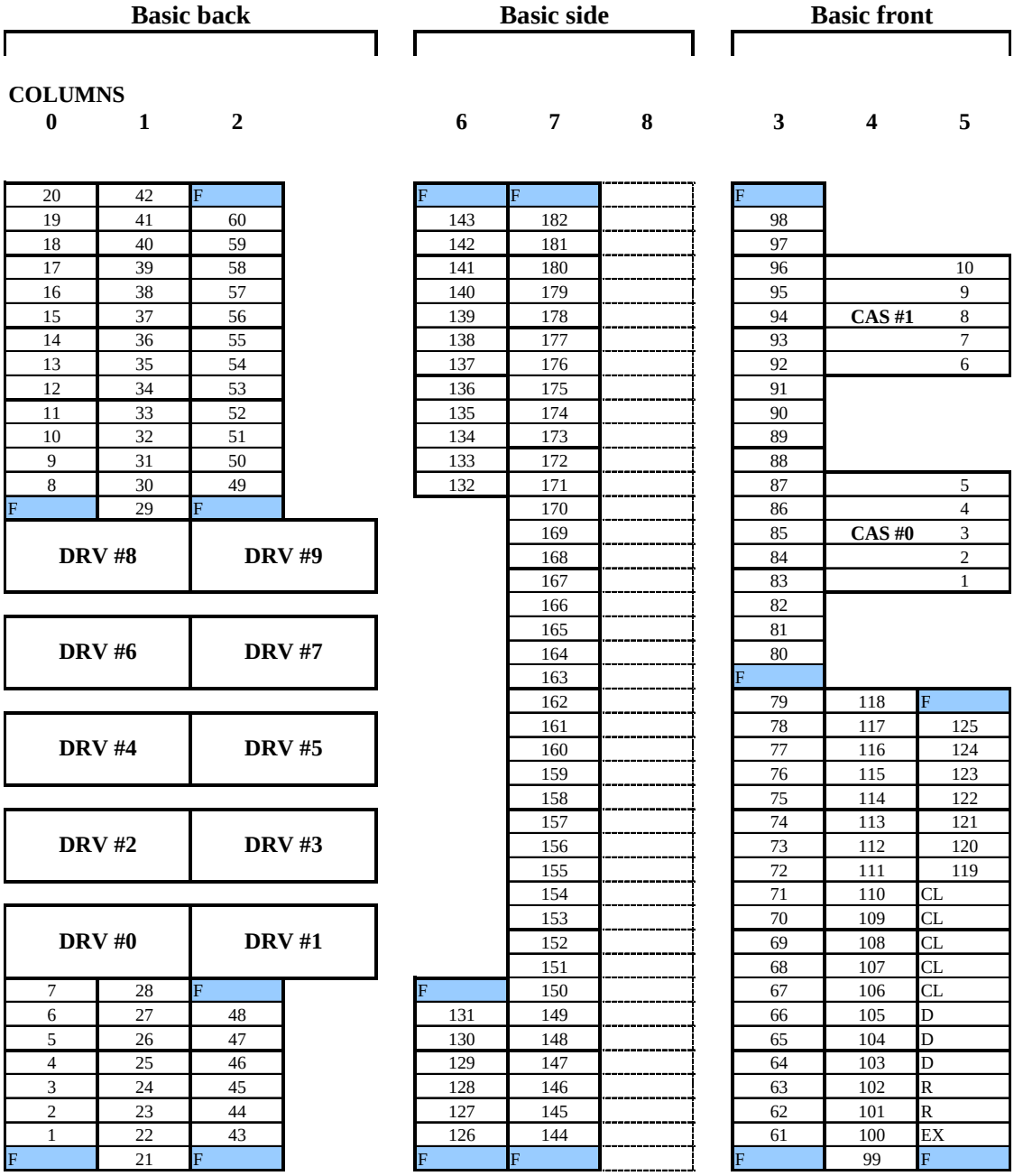


Figure A.2 Model Configuration of Basic Model A20 (10 drive options/182 cell options/10 CASs)

A.3 Model Configuration of Basic Model A20 (10 drive options/221 cell options/10 CASs)

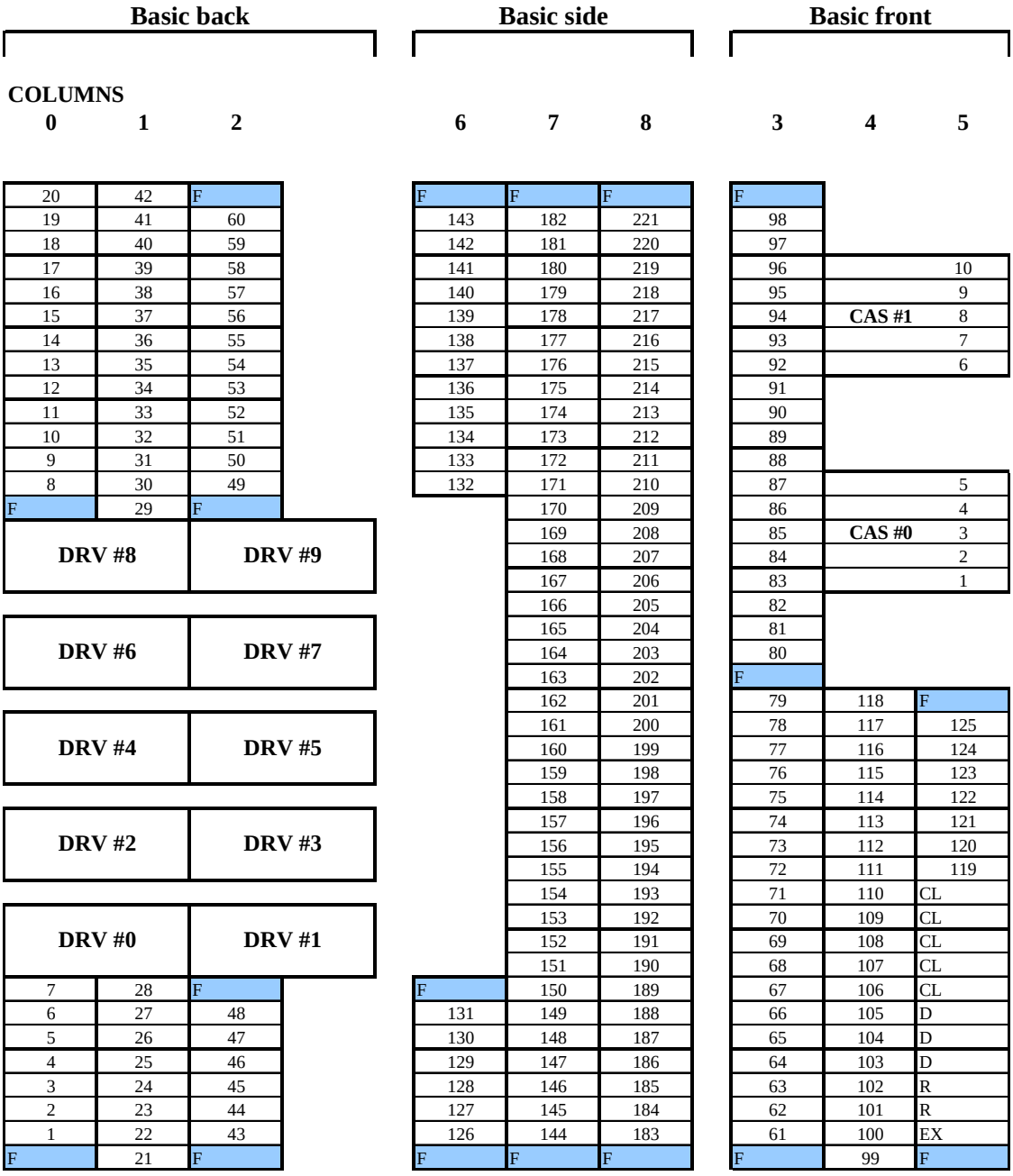


Figure A.3 Model Configuration of Basic Model A20 (10 drive options/221 cell options/10 CASs)

A.4 Model Configuration of Basic Model A32 (16 drive options/89 cell options/10 CASs)

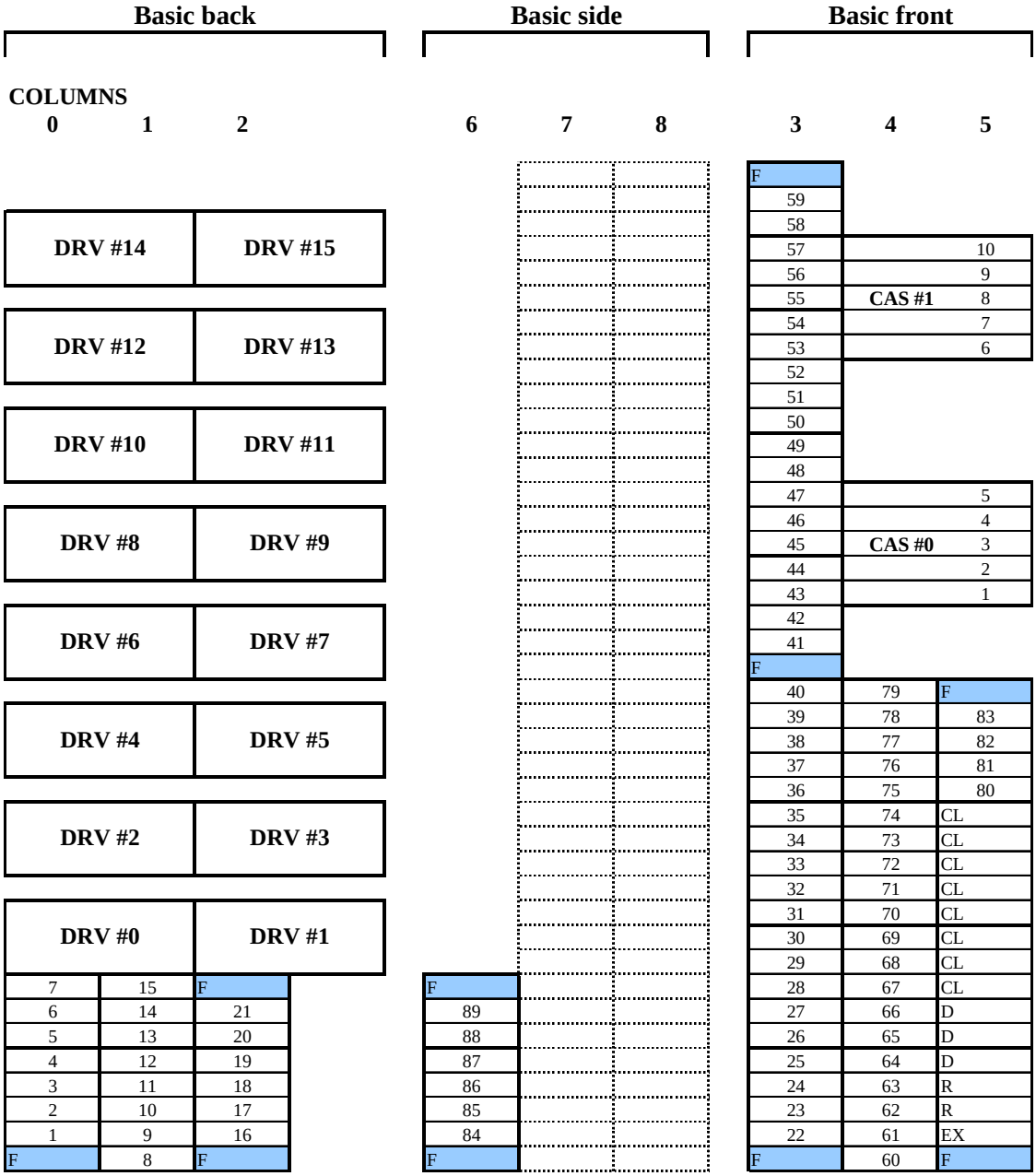


Figure A.4 Model Configuration of Basic Model A32 (16 drive options/89 cell options/10 CASs)

A.5 Model Configuration of Basic Model A32 (16 drive options/167 cell options/10 CASs)

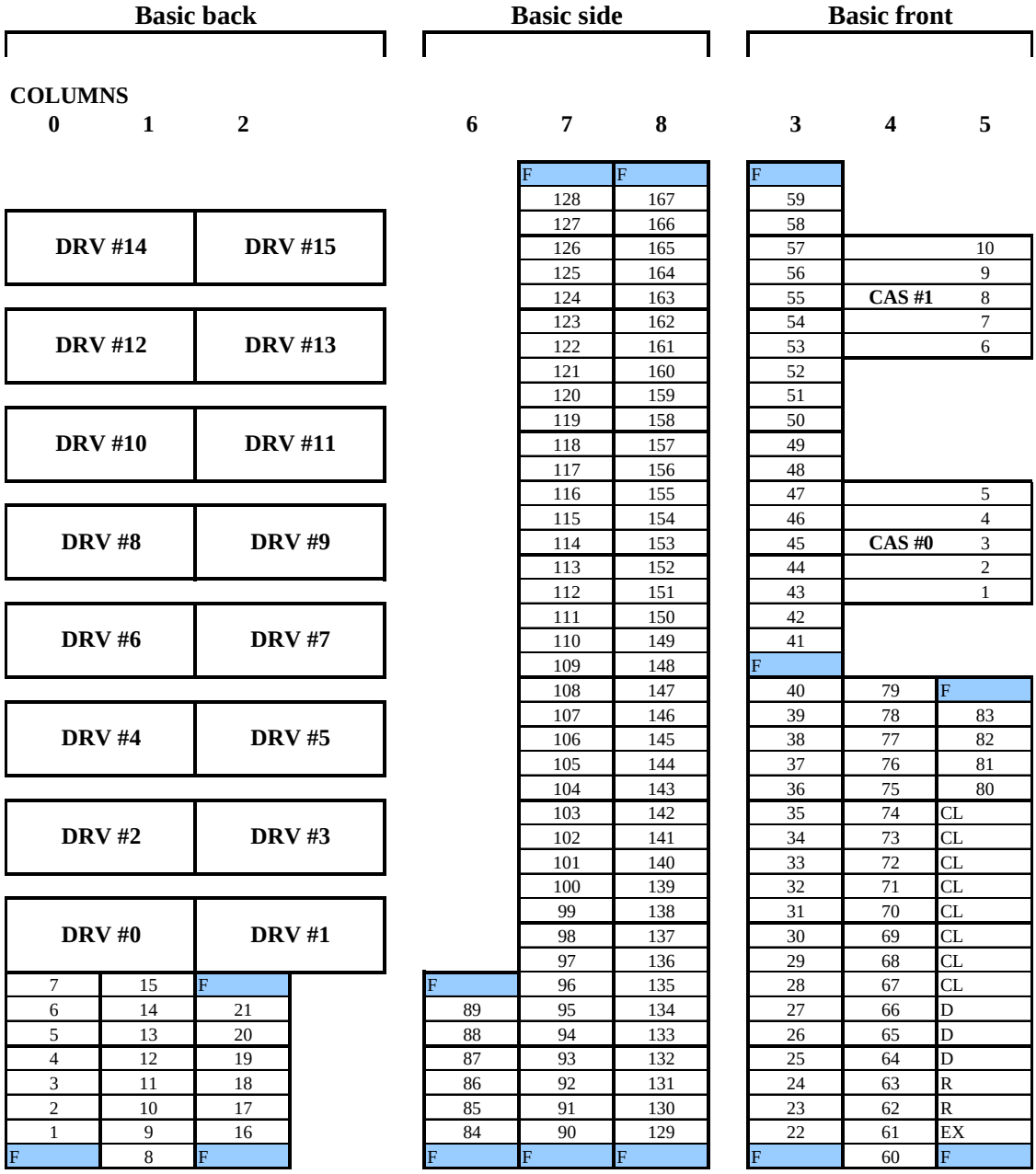


Figure A.5 Model Configuration of Basic Model A32 (16 drive options/167 cell options/10 CASs)

Appendix B Technical Specifications

B.1 Library/Drive Specifications

B.2 Environment Specifications

This appendix explains the library/drive specifications and environment specifications.

B.1 Library/Drive Specifications

B.1.1 Model A20 specification (drive: 1 to 10 units installed)

Table B.1 Model A20 specification

Item		Specification		
Number of cabinets		1		
Number of stored cartridge volumes (*1)		98 volumes	182 volumes	221 volumes
Tape drive	Number of installed drives	1 - 10 units		
Installed tape drive		LTO Ultrium 1 tape drive		
Applicable cartridge media		LTO Ultrium 1 tape cartridge		
Cartridge insertion mechanism (*2)	Number of cartridges	5 volumes/magazine		
	Number of mechanisms/ device	2 units		
Storage capacity (*3) (max/non-compressed)		9.8	18.2	22.1
Data transfer speed * When non-compressed (*4)	GB/h (MB/sec)	54 - 540 (15 - 150)		
External dimensions	Height	1800 mm		
	Width	780 mm		
	Depth	1130 mm		
Mass (media excluded) (*5)		476 kg		
Average tape access time		7 seconds		
Average tape replacement time		12 seconds		
Host interface (up to four channels)		Fiber channel (FC_AL/FC_Fablic)		

Item	Specification
Component for hot swap	Tape drive/cooling fan
Robot controller	1 unit
Number of transport robots	1 unit
Input voltage	100-240V AC
Number of phases	Single phase (with FG)
Power frequency	50-60Hz
AC input system	1 - 2 (*6)
Power consumption (max)	1.3KW
Other interfaces	10Base-T/100Base-TX

*1: To increase the number of cartridge volumes to be stored to 182 or 221, add separate cell options.

*2: Two magazines for holding cartridges are supplied with the library.

*3: The capacity value is calculated by assuming that 1 Tbyte = 1000^4 bytes

*4: The performance of data transfer speed depends on the data compression rate and tape block size.

*5: The mass is the value with the maximum configuration for each model.

*6: The number of PDUs to be installed depends on the number of drives that will be installed.

B.1.2 Model A32 specification (drive: 1 to 16 units installed)

Table B.2 Model A32 specification

Item		Specification	
Number of cabinets		1	
Number of stored cartridge volumes (*1)		89 volumes	167 volumes
Tape drive	Number of installed drives	1 - 16 units	
Installed tape drive		LTO Ultrium 1 tape drive	
Applicable cartridge media		LTO Ultrium 1 tape cartridge	
Cartridge insertion mechanism (*2)	Number of cartridges	5 volumes/magazine	
	Number of mechanisms/ device	2 units	
Storage capacity (*3) (max/non-compressed)		8.9 TB	16.7 TB
Data transfer speed * When non-compressed (*4)	GB/h (MB/sec)	54 - 864 (15 - 240)	

Item		Specification
External dimensions	Height	1800 mm
	Width	780 mm
	Depth	1130 mm
Mass (media excluded) (*5)		527 kg
Average tape access time		7 seconds
Average tape replacement time		12 seconds
Host interface (up to four channels)		Fiber channel (FC_AL/FC_Fablic)
Component for hot swap		Tape drive/cooling fan
Robot controller		1 unit
Number of transport robots		1 unit
Input voltage		200-240V AC
Number of phases		Single phase (with FG)
Power frequency		50-60Hz
AC input system		1 - 4 (*6)
Power consumption (max)		1.9 KW
Other interfaces		10Base-T/100Base-TX

*1: To increase the number of cartridge volumes to be stored to 182 or 221, add separate cell options.

*2: Two magazines for holding cartridges are supplied with the library.

*3: The capacity value is calculated by assuming that 1 Tbyte = 1000^4 bytes

*4: The performance of data transfer speed depends on the data compression rate and tape block size.

*5: The mass is the value with the maximum configuration for each model.

*6: The number of PDUs to be installed depends on the number of drives that will be installed.

B.1.3 Installed tape drive specification

Table B.3 Tape drive specification

Item			Specification
Applicable cartridge media (*1)			LTO Ultrium 1 data cartridge
	Type		Type A
	Storage capacity (*2)	Non-compressed	100 GB
		Compressed (2:1)	200 GB
	External dimensions		21.5 × 105.4 × 102 mm
	Tape length		609 m
	Backup time		1 hour 52 minutes
	Average search time		71 seconds
Recording format			LTO Ultrium 1
Number of tracks			384 tracks (8 tracks, 24 serpentines)
Data encoding method			RLL 1,7
Data compression method			LTO-DC
Tape running speed			4.1 m/sec
Read/write transfer speed			Non-compressed: 15.0 MBps Compressed (2:1): 30.0 MBps
Max transfer speed			Fiber channel: 100.0 MBps
Average access time (100 GB, non-compressed)			Average: 95 seconds
Load time till BOT (tape start)			20 seconds
Unload time (excluding the rewind time)			18 seconds
Rewind time			110 seconds
Repositioning time			2.1 seconds
Buffer capacity			16MB
MTBF (mean time between failures)			250,000 hours
Load/unload service life			100,000 cycles

Remarks:

*1: For detailed specifications and of the cartridge media and how to handle them, see 7.1 "Ultrium Cartridge Information".

*2: The capacity value is calculated by assuming that 1 Gbyte = 1000^3 bytes

B.2 Environment Specifications

Characteristics	Specification
Temperature/humidity	
Operating	10°C to 35°C
In transport	-35°C to 65°C
Wet-bulb temperature during operation	26°C
Wet-bulb temperature during transport	46°C
Humidity	
Operating	20% to 80% (No condensation)
In transport	10% to 90% (No condensation)
Permissible vibration	
Operating	Synthetic seismic wave of 400 gal
In transport	Transport wave of 900 gal, sine wave of 400 gal
Ambient noise	Less than 55dB

Glossary

A

AL_PA: Abbreviation of Arbitrated Loop Physical Address

B

Backup software:
Software run on the host computer. This software is used to track data backup and to execute the library functions.

Board: Printed circuit assembly (PCA). The board is also called a card or adapter.

Bus: Common data path for transmitting data

C

Cartridge Access Station (CAS):
Slot used to insert a tape cartridge into a cell or eject it from a cell. Actually, a magazine is installed in CAS and a tape cartridge is inserted from the slot of the magazine or ejected to the slot.

Calibration:
Routine executed immediately after a tape cartridge is loaded. It is used to determine whether any data is written to the tape, the tape and drive are compatible, and any read/write function is available.

Cleaning tape:
Tape cassette used only for cleaning the drive

D

Drive/Tape drive:
Device used by the library to write data into the tape

Drive cleaning:
One of the library functions that cleans the tape drive using the cleaning tape

Drive module:
Whole assembly that makes up a drive including the metal case and connectors

Differential SCSI:
A type of SCSI cable that can transmit data within a 25-meter distance

E

Event: Important operations for the library that are recorded in the event log. Drive errors, online/offline switching, drive cleaning, and other information are reported to the event log.

F

Optical LAN:
Switched interconnection system to support high-speed data transfer in a fiber channel network

Fiber channel:
Switched protocol used to enable simultaneous communication among workstations, supercomputers, mainframes, data storage devices, and other peripheral devices. The fiber channel can transmit data at a speed exceeding 1 GBps in both directions simultaneously.

Fiber Channel Arbitrated Loop (FC_AL):
Topology to connect multiple fiber channel ports in one loop at a low price without using switches

Display on the front panel:
LCD (liquid crystal display) with five soft keys. This LCD is mounted in the front (in the top stage for a multi-level library) of the library to control all library functions.

G

GBIC: Abbreviation of Gigabit Interface Converter

H

Hardware error:
Unrecoverable electronic error in the library function

HBA: Abbreviation of Host Bus Adapter. HBA, which is also called a host interface card, is a circuit board installed on the host system to handle requests between the host system and library.

Home window: Window on the operator panel display for displaying status information for the drive and library.

Host: One or more computers that generate library data and communicate with the library

Hub: Device with a system for interconnecting multiple ports like a loop using the physical "star" configuration to implement FC_AL

HVDS: Abbreviation of High Voltage Differential SCSI

I

Identity: One of the front panel display options that displays the serial number of the library

IP: Abbreviation of Internet Protocol

J

Jumper cable: Cable to connect the library control card to a drive. This cable is also called a daisy chain cable.

L

Latch stopper: Spring-loaded device that extends from the mount rail. The latch stopper prevents the library from being completely pulled out of the rack, though it can be pulled out by about 2/3.

LED: This is a light emitting diode and is also called simply a lamp. A LED is mounted on each assembly of the library such as the drive module, power unit, library card, and internal assembly. The LED indicates the status information for each assembly.

Library: Data storage system that stores electronic data in tape cartridges. Depending on the model, up to six drive modules are used in the library.

LVDS: Low Voltage Differential SCSI

M

MAC address: Abbreviation of Media Access Control address. This is a unique hardware address for identifying each node in a network.

Magazine: Portable container with a slot that can accommodate five tape cartridges. A magazine can be attached to CAS or detached from it.

Move: One library operation such as loading a tape into the drive or unloading a tape from the drive

N

Nesting: Menu system of the library introduced to control the library stepwise

O

Odometer: One of the front panel display options that displays the operating time and switching of the system

Source: Fiber channel term that indicates the source device of communication

P

Port: Hardware identity within a node through which data communication is conducted

Power (standby) switch: Certain low voltage remaining after turning off the library

R

RMC/Remote management card: Circuit card used to access the library from a computer that is located away from the library

S

SCSI: Abbreviation of Small Computer Systems Interface. This is a bus for transferring data between the host system and library.

SCSI ID: Electronic identification number of each SCSI device in the library. As the library SCSI device, the drive and the library interface controller card are available.

SCSI element reservation:
This enables the host to continue element reservation even if the power is turned off or turned on. This function is usually used so that only a single host can securely access the slot or drive.

Single-end SCSI:
One type of cable whose range is limited to short-distance communication

Soft error: Recoverable electronic error in the library function. This type of error is recorded in the soft error log.

Soft key: Five buttons at the bottom of the front panel display that are used for command execution on the display

Swap: Two related library operations such as moving a tape from the slot to the drive and then moving it back to the slot

Switch: Device that provides (n x n) interconnection so that a complete bandwidth for communication of a port with any other port can be obtained even when other communications are being conducted.

T

Tape/Tape cartridge:
Media used by the library to record data from the host computer

TCP/IP: Abbreviation of Transmission Control Protocol/Internet Protocol

Terminator:
Electronic device for stabilizing the bus signal by connecting to the SCSI bus end

U

UTC: Abbreviation of Coordinated Universal Time

W

Web-based library administrator:
Explains the interface used to monitor and manage the library via the remote management card on a network

Wide SCSI:
68-pin connector. For practical use, the single-end and differential wide SCSI are available.

Index

A

adapter selection window 5-32
adapter status 5-10
alarm error
  operator panel window when error occurring 6-9
  referencing information 4-24
alarm error 6-9
appearance
  front 1-1
  isometric view from left with left side board removed 1-3
  rear 1-2
  rear with open rear door 1-3
auto-cleaning function 1-31
auto-cleaning function, checking setting 2-9
auto-eject function 1-34
auto-eject function, checking setting 2-9
auto-inventory function 1-30
auto-inventory function, checking setting 2-9

B

backup software and driver, installing 2-11
bar code
  label string 7-5
bar code label
  affixing location 7-6
  search window 5-19
  specification and handling 7-5
BCR 1-27

C

cable insertion port, lower part on rear side of device 1-28
cartridge
  drop prevention lever 1-16
  ejecting from magazine 1-18
  ejecting into CAS 3-8
  figure for explaining insertion method 1-17, 1-18
  inserting and ejecting (data cartridge) 3-1
  inserting from CAS 3-8
  inserting into magazine 1-17
  inserting/ejecting by opening front door 3-2
  insertion direction 3-3
  lever for preventing from being inserted backwards 1-17
  loading/unloading 4-41
  operation for unloading remaining in drive when host go down 1-33
  orientation during insertion 1-18
  referencing information 4-11
  removing 6-2
  removing from CAS when CAS external door cannot be opened 6-6
  storage shelf unit 1-16
cartridge 4-9
cartridge access station (CAS) 1-10
cartridge contained in magazine into drive, loading 4-41
cartridge in cell, referencing information about 5-12
cartridge loaded from host, unloading 4-51
cartridge loaded from magazine, unloading 4-42
cartridge status 4-10
CAS
  insertion/ejection handle 1-17
  mechanism appearance 1-10
CAS cartridge cannot be accessed 6-11
CAUTION label 1-19
cell
  cleaning 1-8, 5-14
  diagnostic 1-8, 5-15
  replacement 1-8
  reserve 1-8, 5-15
cell map window 5-12
cleaning 6-12
cleaning cartridge
  ejecting 4-46
  inserting 4-45
  specifying label for 7-6

cleaning cell
referencing cartridge information....4-13
cleaning function 1-31
clock, setting.... 4-36, 5-36
common button area 4-8
component, configuration diagram of standard model.... 1-7
component, configuration of basic model 1-7
connection 1-20

D

date/time setting window.... 5-37
Destination Address.... 5-39
Device Administrator 5-41
device configuration 1-1
Device Location 5-41
Device Name 5-41
device outline 1-1
diagnostics cell
referencing cartridge information....4-16
door
external....1-11
internal....1-11
opening/closing 1-21
drive
checking setting....2-9
cleaning 3-9
cleaning manually....4-43, 5-43
error type of....6-7
information reference window 4-21
procedure for maintenance 6-1
recovery method for error occurring 1-33
referencing information about 4-20
referencing setup information for....5-23
referencing status of 5-8
referencing version number of....4-24
setting target ID of....5-31
setup information display window 5-23
status....5-10
drive....1-20, 4-9
drive cell
cartridge information display window....5-18
referencing....5-17
drive error
mail contents to be sent when error occurring....5-29
drive hardware error
home window displaying....4-49
drive module
appearance....1-19
drive module.... 1-19
drive setting, checking.... 2-9
drive setup window....5-31
drive status....4-10
duplicate login....5-5

E

e-mail function....1-35
e-mail function, setting 5-38
e-mail, referencing setup information for 5-28
Enable Send Trap....5-40
error
mail contents to be sent when error occurring 5-29
releasing....4-48
error history display window 5-25
error history information, referencing....5-25
error information, referencing....4-22
error message is displayed on operator panel....6-10
external door of CAS, unlocking 6-6

F

fan 1-20
fast load function 1-29
fast load function, checking setting....2-10
FC control function....1-29
fiber channel wiring method 2-5
file for restoring, specifying....5-49
firmware version number, referencing....5-27
front door
closing....1-22
opening 1-22
opening and closing 1-21
releasing open status 4-50
front door 1-21
functional overview 1-29

G

general cell
cartridge information display window 5-13
referencing....5-13
referencing cartridge information 4-11

H

hand mechanism
placed on left edge....3-6
placed on right edge....3-6
hand mechanism 1-4
handle....1-20
handling, note on....7-4

hardware error
operator panel window when error occurring 6-8
releasing 4-48
hardware error 6-8
hardware error drive
referencing information for 4-23
hardware error library
referencing information for 4-22
hardware error of drive
releasing 4-48
hardware error of library
operator panel window when error occurring 6-8
releasing 4-48
hardware error of library 6-8
hardware module 1-27
home window, configuration of 4-6
host
checking setting 2-11
preparing installation 2-4
host interface
referencing information about 4-17
referencing setup information for 5-19
setting information about 4-28, 5-32
setting window 5-33
setup information display window 5-20
host interface information reference window
AL connection/hard address being set 4-18
fabric connection being set 4-18
host WWPN
checking setting 2-9
setting 4-31
setting window 4-32
host WWPN list, registering 4-33
host WWPN permitted for each adapter, referencing 4-19

I

icon area 4-7
installation, checking 2-11
interface 1-20
interface card 1-27
internal door
being opened 1-24
closing 1-24
opening 1-24
opening and closing 1-23
internal door 1-23
inventory function 1-30
inventory, making 4-52

L

label affixing, note on 7-4, 7-6
label string, specifying 7-5
LED section, device rear view 1-27, 1-28
library
checking setting 2-9
connecting 2-5
each component of 1-7
error type of 6-8
host do not detect 6-10
installation condition for 2-1
installation space required for 2-2
performance 6-12
procedure for maintenance 6-1
recovery method for error occurring 1-33
referencing information 4-11, 5-12
referencing setup information for 4-20, 5-22
referencing status of 4-9
referencing version number of 4-24
setting information 4-28, 4-34, 5-32, 5-34
setup information display window 5-22
status 5-9
library alarm error 6-9
library error
mail contents when error occurring 5-29
library hardware error
home window displaying 4-48
library performance, poor 6-12
library power is not on 6-10
library setting, checking 2-9
login 5-4
login method 5-3
Loop ID, setting 4-28
LOOP ID/ALPA correspondence table 4-27
LUN, referencing 4-17

M

magazine
ejection method 1-15
figure for explaining mechanism 1-16
inserting from CAS 1-11
insertion method 1-13, 1-14
insertion/ejection port 1-11
opening door 4-39
magazine 1-16
magazine cell
cartridge information display window 5-16
referencing 5-16
referencing cartridge information 4-12
main area 4-6

maintenance 6-1
manual cleaning function 1-32
manual cleaning operation window 5-44
manual load function 1-31
media area, deleting 7-6
menu window, configuration of 4-6
model element, configuration list of 1-9
model, configuration and upgrade pattern for each 1-9

N

network
- referencing setup information for 4-22, 5-24
- setting information about 4-35, 5-35
- setup information display window 5-24

new ID, host computer cannot identify 6-10

O

operator panel
- being inoperative 6-12
- not being displayed 6-12
- overview of 4-1

overview 1-1

P

picker mechanism 3-5
positioning projection 1-11
power
- method for power-off 2-8
- method for power-on 2-7
- switch (power-off) 2-8

power supply 1-27
power to unit 3-10
power-on test failure 6-10

R

RCI
- being not used 2-8
- being used 2-7, 2-8
- not being used 2-7

reader pin, note on 7-4
rear door
- being opened 1-26
- closing 1-26
- opening 1-26
- opening and closing 1-25

rear door 1-25
recovery method
- for drive error occurring 1-33
- for library error occurring 1-33

recovery, function for 1-33
relative position flag 1-20
remote panel
- checking setting 2-10
- frame configuration 5-6
- function 1-34
- menu tree 5-7
- starting window 5-2

remote panel 6-13
reserve cell
- referencing cartridge information 4-14

reset button, selecting 4-49
robot
- appearance 1-6
- part requiring grease in 3-7
- removing cartridge from hand mechanism for failure 6-2

robot 1-4

S

screen saver, setting 4-38
server, turning on 3-11
setup information
- restoring 5-49
- save window 5-46
- saving 5-46

setup information being downloaded, confirming 5-47
SMTP Address 5-39
SNMP
- agent, setting 5-40
- function 1-36
- referencing setup information for 5-30

SNMP trap
- test start window 5-50
- test, executing 5-50
- transmission completion window 5-51

Source Address 5-39
special cell 1-8
status, explanation of 5-14
stopper for drop prevention 1-20
subtitle area 4-6

T

tape cartridge
- environment condition for storing 7-3
- environment condition for transporting 7-3
- handling 7-3
- precaution for using 7-7
- replacement period 7-2

tape is stuck 6-11
target ID
- checking setting 2-9
- referencing 4-17
- setting 4-25, 4-28

time and date, checking setting 2-10
title area 4-6
touch-panel operation 4-1
trace file operation 5-45
transport handle 1-16
transport metal bracket, removing 2-3
transportation, note on 7-3
Trap Destination IP Address 5-40
troubleshooting 6-10

U

ultrium cartridge information 7-1
upgrade pattern
A20 1-9
A32 1-9

V

volume area, specifying 7-6
warning message 5-10

W

window
configuration 4-6
home 4-3
initialization 4-3
menu 4-4
type 4-3
writing to tape failure 6-11

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